Indian Leather Technologists' Association

[A Member Society of International Union of Leather Technologists' and Chemists Societies (IULTCS)]

'SANJOY BHAVAN', 3rd Floor, 44, Shanti Pally, Kasba, Kolkata – 700 107
Telephone : (033) 2441-3459/7320 • TeleFax : (033) 2441-3429
E-mail : admin@iltaonleather.org / mailtoilta@rediffmail.com
Website: www.iltaonleather.org

Mission & Vision

- An Association with over 600 members from India and abroad working since last 64 years for the growth and development of Leather and its allied industries.
- Organize seminars, symposiums, workshops in order to share information, knowledge & latest development and interactions for the benefit of all concerned.
- Organize Human Resource Development programmes on regular basis.
- Publish for over 60 years, a technical monthly journal namely "Journal of Indian Leather Technologists' Association" (JILTA), widely circulated through out the World.
- Publish books for the benefit of the students at various levels of study, for the Research Scholar and the Industry.
- Work as interface between Industry and the Government.
- Assist Planning Commission, various Government Institutions, Ministry and autonomous bodies to formulate appropriate policies for the growth of the Industry.
- Assist small and tiny leather goods manufacturers in marketing their products by organizing LEXPOs in Kolkata and different parts of India.

Now available

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			Inland (INR)	Foreign (USD)
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02.	Comprehensive Footwear Technology	Mr. Shomenath Ganguly	₹ 500.00	$ 50.00
03.	An Introduction to the Principles of Leather Manufacture (New Edition)	Prof. S. S. Dutta	₹ 800.00	$ 50.00
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06.	Hand - Book of Tanning	Prof. B. M. Das	₹ 750.00	$ 25.00
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JOURNAL OF INDIAN LEATHER TECHNOLOGISTS' ASSOCIATION [JILTA]

Indian Leather Technologists' Association is a premier organisation of its kind in India was established in 1950 by Late Prof. B.M.Das. It is a Member Society of International Union of Leather Technologists & Chemists Societies (IULTCS).

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(Member Society of International Union of Leather Technologists and Chemists Societies)

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JOURNAL OF INDIAN LEATHER TECHNOLOGISTS' ASSOCIATION [JILTA]

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LEATHER SCIENCE ABSTRACT [LESA]

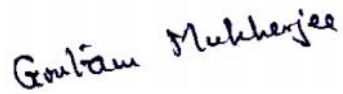
: EDITORIAL BOARD :

India's Export Performance

The Government of India is trying to determine the appropriate value of the rupee. It would be naïve to hold an overvalued rupee as responsible for India's poor exports performance—except for June, India's exports have been contracting for 18 straight months now. Certainly, an overvalued currency makes exports more expensive and is a deterrent, but it is unlikely that prices are as important a factor in poor exports performance as compared to several others. In the booming years of 2004-08 when Indian exports grew by over 25% annually, the rupee appreciated significantly, from 48.3 to the dollar in FY03 to 40.2 in FY08—the reason why the prices of Indian exports rising did not lead to a contraction and that this was also the time when the global economy and trade was booming; during that period, global GDP rose 4.7% and trade 7.8% as compared to 3.1% and 2.7% as on today.

But, the argument goes that value of the currency becomes very important especially at a time when global growth and import demand is muted. While the specifics will be different for each commodity, a good example in this context is textile and apparel exports to the US whereas the EU is a bad example since it gives duty benefits to exports from poorer countries and this distorts the exports performance. Between July 2015 and July 2016, Vietnam's exports to the US rose 6.1% and those from Bangladesh rose 6.8% while those from India did rise a mere 0.8%. During this period, the rupee depreciated 2.1% against the dollar, whereas the Bangladeshi taka depreciated 0.7% while the Vietnamese dong appreciated a little less than 1%.

Though it deals with only apparel exports, a World Bank report, 'From Stitches to Riches' offers an explanation while pointing out that, in the post-MFA period of 2005-12, India's apparel exports rose just 3.7% a year versus 18% for Vietnam, 15.7% for Bangladesh and a healthy 6.9% for China which already had a very large export base by 2005. For one, hourly wages in India were $1.06 in 2012 versus $0.51 in Bangladesh, productivity was lower (India is ranked #6 in a buyer perception survey versus #3 for Vietnam), it has longer lead times in deliveries (India is ranked #6 versus #2 for Vietnam) and has a poor presence in synthetic fibres compounded by high import tariffs on them. While the competitive position will differ in different export areas, a lot also depends on how well integrated Indian firms are in global supply chains as also the quality of India's products e.g. in the refinery space, with Reliance's refinery among the top in the world, India is very competitive while in the case of automobiles, being part of Suzuki or Hyundai's export chain is a big positive. A competitive currency will obviously help boost exports, but at a time when FDI and FII flows are strong, weakening the currency will require RBI to buy dollars which implies a cost and can trigger competitive devaluation by other countries—apart from the fact that a weaker rupee is also more inflationary, it also hits companies with high foreign debt.



Dr. Goutam Mukherjee

Announcement

Waterless Chrome Tanning Technology Demonstration and Workshop in Kolkata

CSIR-Central Leather Research Institute has developed a new technology called Waterless Chrome Tanning Technology (WLCT). Demonstration of the technology has been conducted in clusters such as Erode, Kanpur and Jalandhar. It is proposed to conduct the demonstration of Waterless Chrome Tanning Technology (WLCT) in CLC during the 4th week of October, 2016 (24thto 26th). This will be followed by a workshop on the 27th October, 2016. In this workshop, the outline and benefits of the technology will be shared with the CLC tanners. The workshop will offer an opportunity to have direct interaction with the inventors. As many as 25 tanners have initiated obtaining the license of the technology.

All the stakeholders are invited to participate in the workshop. For further information the Head, RCED may be contacted at the following address.

Regional Centre for Extension and Development (CSIR-CLRI),
3/1C, Matheswartala Road,
Kolkata – 700 046.
Tel: 033 2329 2381/6046; Cell: 09477032857
E-mail IDs: rcedcal@bsnl.in& clri.dipankar@gmail.com


IULTCS 2017
INDIA
XXXIV IULTCS CONGRESS
5-8 February 2017, CSIR-CLRI, Chennai, India
www.iultcs2017.org
"Science and Technology for Sustainability of Leather"
IULTCS
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IFLMEA
Indian Finished Leather Manufacturers & Exporters Association (IFLMEA)
For further details please contact: Congress Secretariat, CSIR-CLRI, Chennai, India, Email: iultcs2017@clri.res.in

XXXIV IULTCS CONGRESS

(International Union of Leather Technologists and Chemists Societies)

"Science and Technology for Sustainability of Leather"

R&D focus of research institutes, chemical companies and organizations around the world has been the sustainable development of the leather sector. In this scenario, the congress aims to address the following technological challenges:

- Fundamentals in leather science
- Strategies for sustainability
- Innovation and value addition for leather
- Advances in chemicals for smart and intelligent leathers
- Design innovation for lifestyle leather products
- Emission control strategies
- Enriching human capacity
- Global research alliances and partnerships

Important Dates:

- Congress Dates: 5 – 8 February 2017, preceded by India International Leather Fair, Chennai (1–3 February 2017)
- Congress Localization: Chennai
- Abstract submission due: 31 October 2016
- Selection of papers: 15 November 2016
- Early bird registration till: November 2016
- Expected Number of Participants: 200 International, 300 Indian

Organizers:

- Indian Leather Technologists Association (ILTA)
- CSIR-Central Leather Research Institute (CSIR-CLRI)

Congress Partners:

- Council for Leather Exports, India (CLE)
- Indian Finished Leather Manufacturers & Exporters Association (IFLMEA)

Organization committee:

- Congress President: Dr T Ramasami, Former Secretary, S&T, Govt. of India
- Patrons:
  - Mr M Rafeeque Ahmed, Chairman, Council for Leather Exports
  - Mr N Shafeeq Ahmed, President IFLMEA

- Institutional representatives:
  - Dr B Chandrasekaran, Director CSIR-CLRI,
  - Mr Arnab Jha, President ILTA,
- Congress Convener: Dr N K Chandrababu, Chief Scientist, CSIR-CLRI;
- Working President: Dr S Rajamani, ILTA

Indian Leather Industry, through CSIR-CLRI & ILTA and through the Council for Leather Exports and IFLMEA welcome all the visitors, industrialists, academicians and researchers interested in leather to participate at the XXXIV IULTCS Congress. With India International Leather Fair, just before the congress and good climate to visit Chennai, the participants to the congress would be taken through a rich experience of S&T innovations in leather and the cultural diversity of India.

Please visit website www.iultcs2017.org for further details.

UPDATE on The IULTCS Merit Award - 2017

The 2017 IULTCS Merit Award for Excellence in the Leather Industry has been awarded to:

Professor Dr Mariliz Gutterres, Laboratory for Leather and Environmental Studies (LACOURO), Federal University of Rio Grande do Sul (UFRGS), Porto Alegre, RS - Brazil.

The 2017 IULTCS Merit Award will be presented at the IULTCS Congress in Chennai, 5th – 8th February 2017.

(Source: Email from Campbell Page, IULTCS Secretary – 6th July' 2016)

Change of e-mail address for IULTCS Secretariat

On & from 27/09/2016 the e-mail ID of Mr. Page Campbell, IULTCS Secretary, has been changed:

Hence the Full Address and E-mail ID of Mr. Page as well as the Office Address of IULTCS Secretariat will be as follow:

Address: Mr. Campbell Page
IULTCS Secretary
C/o – VESLIC , Postfach 505
CH – 4016 Basel
Switzerland

E-mail: campbellpage3@gmail.com ; office@iultcs.org

Source: Email from Dr. Campbell Page, dated – 28/09/2016

58th Annual General Meeting

Notice of 58th Annual General Meeting of the Association was posted on 8th September' 2016 and the AGM was accordingly held at the Auditorium of Indian Science Congress Association, 14, Dr. Biresh Guha Street, Kolkata – 700 017 on Thursday, the 29th September, 2015 at 3.00 pm to transact the following business.

Normal Business :

1. To confirm the Proceedings of 57th Annual General Meeting held on 24th September 2015.

2. To consider and adopt the audited Balance Sheet and Statement of Accounts for the Financial Year ending 31st March 2016.

3. To consider and adopt the Annual Report of the General Secretary on behalf of the Executive Committee.

4. To appoint Auditors in place of M/s Ray & Ray who are retiring but are eligible for reappointment and to fix remuneration.

Schedule of LEXPOs in FY 2016 – 17

Competent authorities have already allotted ground to us for holding LEXPOs at Kolkata and Siliguri as per our request. Accordingly LEXPO–XXXX at Kolkata will be held at Geetanjali Stadium, Kasba, Kolkata for 16 days from 047/02/2017 – 19/02/2017 and LEXPO–XXIII will be held at Kanchanjungha Krirangan Stadium adjacent ground for 16 days from 11/03/2017 – 26/03/2017.

So far as organizing LEXPO – IV at Durgapur is concerned, we have been assured of formal allocation of Gandhi More Maidan, City Center, Durgapur after the puja holidays as per our request with the fair period of 16 days from 31/12/2016 – 15/01/2017.

Seminar / Workshop proposed to be organized by ILTA & MSME

On receipt of a request we have expressed our willingness to extend our cooperation and support for organizing a Seminar/workshop jointly with MSME, Kolkata.

In all probability the seminar/workshop will be organized at the Freya Design Studio, CLC, Bantala on any date of third week of November' 2016.

More details nearer the time.

TATA Tele Services, Kolkata willing to be a partner to our Association

We received an offer from TATA Tele Services, Kolkata which is quoted below :

Quote:

We would like to partner your Association for the following categories/happenings :

- Space booking for our ad material in your journals/newsletters for advertising purpose
- Branding-Logo put up at backdrop/outdoor ad/standee during the event.
- Sponsorship – For your events-Monthly/quarterly meetings/AGMs etc where we network with your members for their Wireless/Wireline Telecom solutions requirements
- Press coverage – Joint press conference between your association Chairman & Tata Teleservices Limited representative, where we announce jointly of our association/or thru a press release
- Association Members – interested members can come for our product meets/workshops on a monthly basis in five star hotels
- Require database after completion of event (in excel format)

Unquote

We have invited them to our office for detail discussion on a date in 3rd week of October' 2016.

Discussion on a Footwear Project

Mr. Shome Nath Ganguly, former Director, CFTI – Agra, former Principal of Karnataka Institute of Leather Technology, presently working as In-charge, Freya Design Studio, CLC, Bantala, West Bengal and a Life Member of ILTA was invited to participate and elaborate on a Footwear Project' in the 493rd E.C. Meeting, scheduled at 6.30 pm on Thursday the 27th September'2016.

Mr. Ganguly in the discussion elaborated his idea that we can utilize the vacant 4th floor of ILTA building for the long awaited development of the footwear industry in Eastern Part of India.

Product Development including Sample making, Designing and Forma & Last making of footwear and marketing can be performed by a footwear expert jointly with ILTA.

The footwear expert is well known to Mr. Ganguly and it was decided that the expert will come to visit ILTA building within a few days and thereafter a complete project Report would be submitted to the ILTA Executive Committee for further discussion.

You are requested to :-

a) Kindly inform us your '**E-mail ID**', '**Mobile No**', '**Phone No**', through E-Mail : admin@iltaonleather.org / mailtoilta@rediffmail.com or over Telephone Nos. : 24413429 / 3459 / 7320. This will help us to communicate you directly without help of any outsiders like Postal Department / Courier etc.

b) Kindly mention the unique **Membership No.** against your each and every communication, so that we can locate you easily in our record.

c) **Kindly obtain an Acknowledgement Slip (available at ILTA Office) for any document handed over to ILTA Office.**

Susanta Mallick
General Secretary

Executive Committee Members meet every Thursday at 18-30 hrs. at ILTA Office.
Members willing to participate are most welcome.

Bio-Technology in Leather Industry

Prof. Dr. EL-Shahat Hassan Abdel-Lattife Nashy

Chemistry of Tanning Material and Leather Technology Department
National Research Center, Giza, Egypt.

INTRODUCTION

The meat processing industry generates hides of dead animals which would have caused environmental problems in disposal, had it not been for the leather industry. Fortunately the leather industry makes use of these hides to process it further and make leather. Although the leather industry takes care of this environmental problem and generates employment, the processing of hide to leather itself generates a fair amount of pollutants. That is because, the conventional processing of leather involves the use of chemicals and the maximum amount of solid wastes like lime and chrome sludge and noxious gases are generated during the leather processes. It is in these areas that biotechnology through the use of enzymes has played a key role in refining the process of leather making. Globally, the leather industry is currently undergoing radical transformation due to pollution and discharge legislations. Thus, the leather industry is pressurized to look for cleaner options for processing the raw hides and skins. It is worth mentioning, before discussion of the biotechnology in leather industry, to give an idea of the hide structure.

General Consideration of Hide Structure

Hides and skins consist of fatty materials, carbohydrates, mineral salts, water and different types of proteins. The most important for leather making is the proteins. These proteins composed of many types; the important one is collagen, which in tanning converted into leather. All hide proteins belong to one of two large groups: **fibrous proteins** (collagen, keratin and elastin) and **globular proteins** (albumins, globulins and various proteides & melanins) [1, 2].

In general, the fibrous proteins are seen to be concerned with the structural morphology of the tissue. In contradistinction to the structure functions of the fibrous proteins, the globular proteins are usually involved in the vital processes of the tissue. They are generally soluble in water or dilute salt solutions (so, can be removed in Beam-house operations).

Global Leather Production

The following figure (1) shows the production volume of leather producing countries last 20 years through the world. It is clearly from figure (1) overleaf that, the major contribution from Asian continental and second form Europe. The contribution from American zone is also significant [3]. The yearly world production of fresh hides is 8-9 million tons per year. During the processing of these hides, the waste production is 1.4 million tons per year.

* Corresponding author's e-mail: elshahat_nashy@yahoo.co.uk ; nashy_eha@yahoo.com

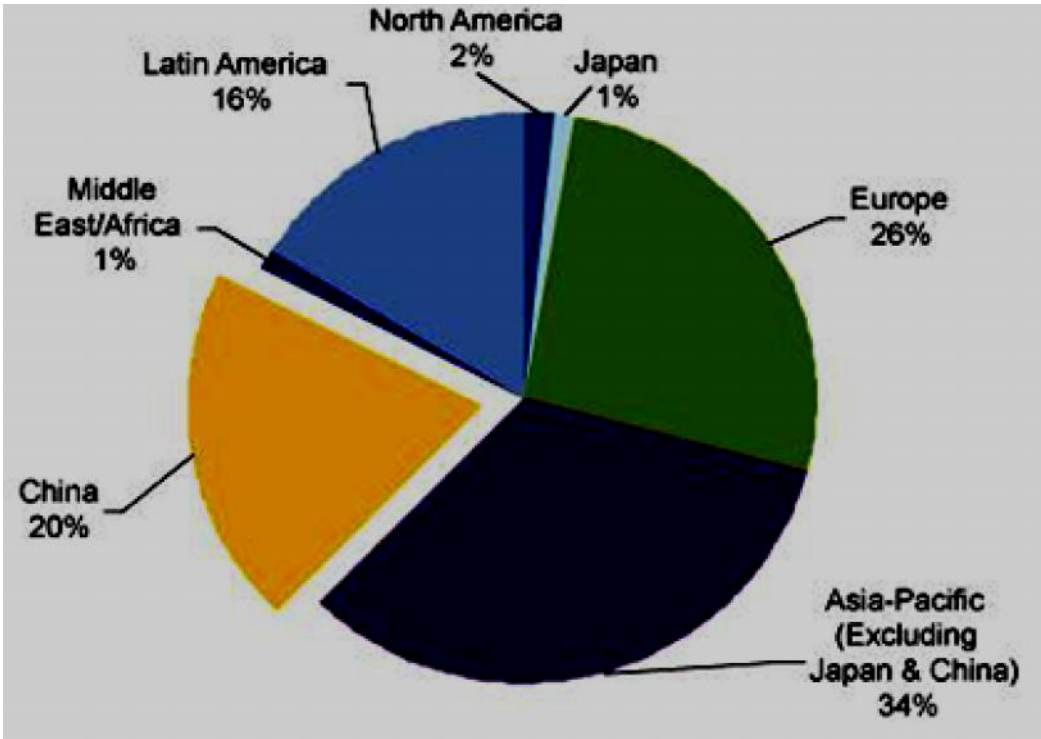

Figure (1): Global leather production in last 20 year throughout the world

Biotechnology in industry

Enzymes are being used in numerous new applications in the food, feed, agriculture, paper, leather and textiles industries, resulting in significant cost reductions. At the same time, rapid technological developments are now stimulating the chemistry and pharma industries to embrace enzyme technology, a trend strengthened by concerns regarding health, energy, raw materials, and the environment. The use of biotechnology presents a lot of advantages for industries. Some advantages are: commonly the reaction or biotechnological processes occur at low temperatures and at atmospheric pressure; the process has a high space-time yield, renewable ingredients and in many cases a reduction of environment impact.

Definition of Biotechnology

According to Belgian Academy Council of Applied Science (BACAS, 2004) biotechnology was defined as the using of biological processes, organisms, or systems to manufacture products intended to improve the quality of human life. In recent years, biotechnology has expanded in sophistication, scope, and applicability, "Biotechnology means any technological application that uses biological systems, living organisms, and/or their enzymes to create industrial products that are more easily degradable, require less energy, create less waste during production and sometimes perform better than products created using traditional chemical processes.

Impact of enzyme technology in industry		
Sector	**Keywords**	**Comments on publication**
Agriculture	- Feed additives - Heterologous enzyme production	- Positive effects on environment, animal health, and efficiency - Laccase and trypsin productions in plants
Chemicals	- Biocatalysis - Polymers - Bulk organic compounds	- Review on preparative bio-transformations - Polymer synthesis by in vitro enzyme catalysis - Review on pathway engineering
Cleaning	- New detergent enzymes	- Increased competition and lower prices
Energy	- Fuel alcohol from biomass	- Genencor and Novozymes contract with DOE - Iogen biomass-to-ethanol demonstration plant
Food	- Enzymes used in food preparation - Nutraceuticals	- Editorial on new enzyme applications in food - Increased carotene content of tomato
Pharma	- Chiral compounds - Glycoprotein engineering - Enzymes as pharma targets	- Enantioselective biocatalysis - In vitro protein glycosylation - Several reviews in edited book
Materials	- Paper, textile, leather treatment - Biosteel (silk)	- New enzymes from extremophiles - Heterologous expression of spider silk

Table (1): gives a few recent examples of the broad and growing impact of enzyme applications in different industry sectors

Table coated from ref. [4,5].

Biotechnology and Leather Industry

In leather production, biotechnology, mostly using enzymes, can be applied in different steps of process for several years. Enzymes can be used at all stages in the leather-making industry, with the exception of the actual tanning process. At present, biotechnology are being used in leather production with relative success in soaking, liming, de-hairing, bating, dyeing, degreasing and in part obtaining a decrease of water quantity used during the process and less chemical were added Several biotechnological options are available for handling effluents and proteinaceous solid waste treatment [6]. So, biotechnology can be used in leather production and it will contribute for the reduction of pollution.

PROCESSES OF LEATHER PRODUCTION

Food and Agriculture Organization of the United Nations (FAO) states that in the year 2005, total of 1.7 million pieces of raw hides were produced worldwide [7,8]. The transformation of hide or skin into leather can be proceeding by many chemical and mechanical processes.

According to Thanikaivelan et al. (2004) [9], biotechnology has been used in the tanning industry for several years. The leather industry is well suited for enzyme technology because products as well as raw materials consist of biomolecules, which can be produced, degraded or modified by enzymatic processes. Today several chemicals used in leather processing have been substituted with enzymes, which lead to become more efficient and quicker. So today proteases, lipases and amylases are used in leather manufacturing.

The tannery effluents were proved to have acute toxic effects on human beings (Sahu et al., 2007) [10], animals (Muley et al., 2007) [11] and plants (Nath et al., 2005, 2009) [12,13]. Therefore it was necessary for tanners to modify the conventional processes so as to minimize the polluting elements present in the effluents (Soyaslan and Karaguzel, 2008) [14].

The leather production can be looked into the main three following steps:

A. Pre-Tanning Processes (Beam-house Operations)
B. Tanning Process
C. Finishing Processes (application of aesthetic materials)

A. Pre-Tanning Processes (Beam-house Operations)

The objective of beam-house operations is to remove hair, fats, unwanted components, etc., leaving a network of hide protein fibers to be ready for tanning [15]. Beam-house operations produce the biggest part of the effluent load of tanneries. Generally, it account 70–80% of the total COD of effluent from all leather making processes. About 75% of the organic waste and 70% of this waste is from hair which is nitrogen rich. These figures clearly illustrate the contribution made by the lime and sulfide process towards pollution [16].

1. Waste waters are highly alkaline, in a pH range of 10 to 12.
2. Sulfide is highly toxic with obnoxious odor, and if left untreated, it can cause major problems in the sewers.
3. The severe alkaline condition is a health hazard for the workers.

Soaking

The process uses a large amount of water, up to 20 cubic meter water per ton of hide. During this process, two effects have to be achieved of cured hides:

1. Cleaning up of the surface of the hide from salts, bacteria and soluble proteins as well as dirt, blood and dung.

2. Rehydration of the interior fibers of the hides to bring skins as far as possible back to state of green hides.

Traditional Process

Salted hides, fresh hides and chilled hides all require several washings with fresh water under strong mechanical action for proper cleaning. The wash float should be changed at

least twice with fresh water after 30 to 60 minutes of drumming. Soaking, generally, takes 6-9 hours for salted hides and several days for dried hides. Final rehydration float is currently enhanced by adding either **0.3% sodium hydroxide,** or **surface active agents of nonionic detergents type**. Full rehydration of the fiber structure is a very most important precondition for all of beam-house operations. In the traditional process **bactericides** and **fugicides** are used to inhibit bacteria and mould growth in soaking liquors.

Biotechnological Process

The conventional process of soaking takes **nine hours**. But proteases and lipases used along with surfactants can reduce the time required to **five hours.** Soaking enzymes are used to shorten production time by attacking solidified fats and non-collagenous proteins that interpose themselves between the fibers. These proteins sometimes cover the external surfaces of the hide, making contact between collagen fibers and water was difficult [17]**.** The enzymes used in soaking target a broad-spectrum of reactions to obtain both solubilization and removal of the interfibrillar proteins, enabling easy rehydration of the skin. The types of enzyme used in the soaking of hides are **carbohydrases** and **proteases**.

The advantages of enzymatic soaking

Thanikaivelan *et al*. (2004) [9], stated that the principal advantages are:

1. Shorter wetting times by 10–20 h.
2. better fiber opening
3. Solubilization and removal of proteins, fat and carbohydrates.
4. Loosening of the scud
5. Production of leather with less wrinkled grain when used at an alkaline pH of less than 10.5 (especially well at pH 8-9).
6. Improves the softness and elasticity,

However, a major disadvantage of their use is the added costs involved.

Liming and De-hairing

De-haring is an essential step of the pre-tanning processes of leather manufacture wherein the hair along with epidermis, non-collagenous proteins and other cementing substances are removed from the skin [18]. Enzymes can be used to remove hair, epidermis, residual components, dispersion of adipose components and reduction on effluent load. Macedo et al. (2005) [19] studied the capacity of removal of hairs using keratinase obtained from *Bacillus subtilis*. Dayanandan et al. (2003) [20] studied the de-hairing of hides using an alkaline protease, isolated from *Aspergillus tamarii*.

a. Traditional Process

Liming and de-hairing are usually performed in one single operation using high proportions of lime and sulfide [21]. These materials are a source of pollution in the spent lime liquors.

The disadvantage is that it generates large quantities of solid waste. Although sulfide is toxic, it is the prime depilant in the de-hairing process. It is now possible to reduce sulfide at its source using enzyme-assisted processes [22].

b. Biotechnological process

Proteolytic enzymes of bacterial and fungal origin can now be used as an alternative for the conventional method. Enzymes used in de-hairing are generally proteolytic, catalyzing the breakdown of proteins matter at the hair base. The origin of proteolytic enzymes used in de-hairing process can be animal (e.g. from bovine or porcine pancreas), [23] bacterial [24, 25] fungal [26-28] and plant [29]. The enzymatic process does not produce toxic wastes and is far quicker and shorter time.

De-hairing can be done using extra cellular protease secreted by *Bacillus isolate*, by *Rhizopus oryzae* and by alkaline protease from *Alcaligenes faecalis*. Alkaline protease produced from *Aspergillus tamarii* was found to be a potent de-hairing enzyme for cleaner leather processing. This enzyme not only reduces the pollution problem of BOD, COD and TDS but also improves the strength property of the leather. Many reports are available for de-hairing, either free of lime or sulfide and or both, none of these methods have found commercial application in tanneries [14, 26, 30-31]. Some enzymatic de-hairing system uses proteolytic enzymes along with small amounts of sulfide and lime [32]. Any de-hairing system should take care of the leather qualities as well as the environment.

The major factors in their commercial utilization will depend on lower cost of production, application and the stability of the enzyme preparation at different environmental conditions involved. In general, **there are three methods** of application are commonly used in the enzymatic de-hairing process:

i. Paint method

ii. Dip method

iii. Spray method.

In the paint method, the enzyme solution is mixed with an inert material like kaolin, made into a thin paste, adjusted to the required pH, applied on the flesh side of hides piled flesh to flesh, covered with polythene sheets and kept till de-hairing takes place.

In the dip method, the hides or skins are kept immersed in the enzyme solution at the required pH in a pit or tub. The disadvantage encountered in this method is unavoidable dilution of the enzyme solution. Even though enzyme penetration is observed to be uniform, de-hairing at backbone and neck is not up to the mark.

A novel spraying technique has been adopted for the application of multi-enzyme concentrate in depilation. The advantages of the spray method over the painting and dip methods are that:

1) Even concentrated solutions can be sprayed,

2) When enzyme solution is sprayed on the flesh side with force, entry becomes easier.

3) Backbone and neck can be sprayed with more amount of enzyme, thereby making the process quicker,

4) There is no effluent arising out of this method, and

5) After depilation, hair will be almost free from all the adhering skin tissues. of late, de-hairing by drumming is being practiced, and industrially this should be feasible.

The advantages of enzymatic De-hairing include:

1. Cleaner grain surface and improved area yield and softness.

2. Reduction the sulfide and lime requirements by as much as 40% , so fewer chemicals in the wastewater

3. Shorten the liming time by at least half without any loss of quality.

4. Another possibility is to avoid the use of amines, which can be converted into carcinogenic compounds.

5. Good keratinase from ***Bacillus Licheniformis*** that has the potential to replace sodium sulfide in the de-hairing process as reported by **Nashy**, et al, 2005 [33].

6. Also, **Nashy**, et al, 2006 [34] stated that, a very good Keratinolytic Activity of ***Aspergillus Nodulans*** on de-hairing of Ovine hides.

7. Recent work was carried out by **Nashy**, et al, 2014 [35] was devoted to isolate a new microorganism ***Cyberlindnera fabianii NRC3 aza*** from keratinous wastes for the production of keratinase enzyme and its application as a hide de-hairing agent under a short time and mild conditions with good skin quality.

8. Enzymes do not dissolve the hair while conventional chemicals degrade the hair; thus reducing the chemical and biological oxygen demand of the wastewater.

9. It is possible to filter out the hair through enzymatic process so hair can be recovery of good quality and strength with a good saleable value.

10. Creation of an ecologically conducive atmosphere for the workers.

11. Enzymatically dehaired leathers have shown better strength properties and greater surface area.

12. Simplification of pre-tanning processes by cutting down one step, viz. bating.

13. The enzymatic process contributes to a large decrease of COD and BOD Parameters, along with the levels of nitrogen and sulfides, which is environmentally extremely important.

14. Elimination of the de-liming steps.

Factors impeding the implementation of enzymatic de-hairing include:

1. Cost of production of enzymes,

2. Scale up and bio-processing,

3. Proteolytic enzymes attack the collagen of the grain layer to a certain degree, thereby imparting damage to the grain structure [36].

4. Suitability and efficacy of enzyme preparation to process different raw materials such as skins and hides without damaging the collagen by hydrolysis

5. The inability of the enzyme to remove fine hair.

6. Currently, many commercial enzymes are being used for enzyme-assisted de-hairing process; but the use of lime/sulfide is not completely eliminated [32].

7. Some of the reported lime and sulfide free enzymatic de-hairing processes adopt either an enzyme carrier such as sparingly soluble kaolin in significant quantities [37] or soluble silicates [38]. This may contribute to a significant rise in COD and TDS and TSS of effluent.

8. Although many reports are available for de-hairing, either free of lime or sulfide and or both, none of these methods have found commercial application.

Among the numerous studies undertaken to develop an alternative to de-hairing processes, de-hairing by proteases from microbial sources exhibits advantages in terms of scalability, efficiency and pollution control. It was also observed that the enzymatic de-hairing causes no losses of resistance on the samples, either tanned with chromium or in the chromium-free formulation; otherwise, the leather presented similar softness characteristics. Similar results were reported by Saravanabhavan et al. (2003) [39]. Jian et al. (2011) [21] found no significant differences between the tanned skins treated with the two enzymes and the chemical process.

De-hairing Mechanism

a. Traditional Mechanism

In the conventional de-hairing process the keratin protein S-S bridges of the hair and epidermis are broke down using reductive agents (usually reductive sulfur or thio-compounds) under alkaline conditions without influencing the collagen fiber network. Disulfide link in cystine, the major stabilizing bond in keratin, is subjected to nucleophilic attack by sulfide ions. Reduction can be performed by exchanging with one of the sulfur atoms in the disulfide bridge of cystine (figure 2).

Lime, being an alkali, contributes to swell of skins by removing the electrical charge from the basic groups in collagen and changing the dimensions of its structure [40] (Menderes et

al., 2000). Lime also opens up the collagen fiber bundles that are abundantly distributed in dermis and the underlying corium layer of skin by removing much of the charged glycosaminoglycans (GAG) from proteoglycans (PG) through b-carbonyl elimination [41, 42]. At the same time, they bring loosening up of the collagen fiber texture and partial saponification of the natural grease. The removed substances can be separated from effluent in a solid form. Liming with lime and sodium sulfide takes 12-18 hours, depending on the sodium sulfide concentration. The hairs are destroyed either completely or partially.

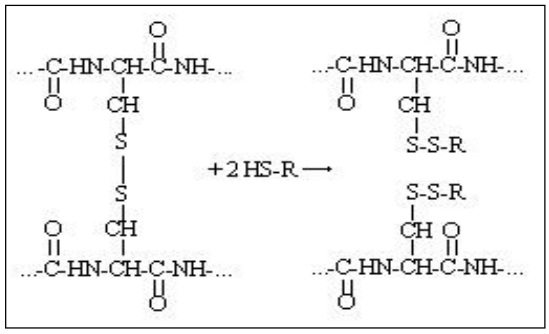

Figure (2): Exchange of sulfur atoms

b. Biotechnological Mechanism

The enzymatic de-hairing is a very special case of the application of enzymes, in which proteolytic enzymes attack the hair roots and the epidermis, and usually the amount of chemicals added to the process is greatly reduced [43]. When the hair bulb was subjected to protease action, hair could be dislodged from the surrounding follicles, as the sac of the hair bulb was less in fibrous keratin [44]. This in turn assisted the diffusion of enzyme through collagen layers towards epidermis, consequently dislodging the hair from hair follicle without damaging the hair. The protease was able to produce de-haired pelts wherein the non-collagenous components were completely removed and the collagen network was fully opened up.

Comparison

The complete removal of enzymatic de-hairing can take place at an unusual pH (8.0) compared with that required for processes that use lime (pH 12.0). While, Lime and sulfide did not have significant action upon elastic fibers, which they were removed later in a step called bating. Removal of elastin in enzymatic process imparted softness and more flexible properties on the final leather and this feature was beneficial for producing certain types of leather such as upholstery and gloving leather [42]. A major advantage of enzymatic de-hairing process was that bating step in leather processing could be avoided

The action of lime and proteases upon cementing substances was quite different. Lime caused osmotic swelling of skins by hydrolyzing the amide side chains from the basic groups such as asparagine and glutamine in collagen and forming more or less dissociated collagenates [45]. This produced an even negative charge on the collagen units resulting in the distortion of collagen fibrils due to the electrostatic repellency of identically charged areas [46].

The hydrostatic pressure built up in the collagen fiber structure enhanced the splitting up of fiber bundles [47] leading to a shortening and thickening of each fiber and an increase in thickness of the whole fiber structure [48]. Strength and bulk properties of the leathers (especially softness) show some improvement as a result of grain softening by the enzymatic action. In addition, it was shown that this de-hairing process has an environmental benefit, reducing COD and total solids loads by 45% and 13%, respectively [49].

Scanning electron microscope (SEM)

SEM is a useful technique for evaluating the effect of various treatments on the skin, because SEM looks deeply into hide fiber structure and shows the effect of different treatment on fiber and grain surface **(Nashy et.al, 2005) [33].** Thus, a morphological study was carried out to assess the evaluation of enzymatic de-hairing process in comparison with the conventional de-hairing method. As shown in Figures 3 and 4. Scan micrographs of the grain surface (100x) and the cross section (200x) of the skin were carried out to show the effect of the obtained enzymes on the grain surface and fiber bundles as de-hairing agents.

From the cross section micrographs [Figure 3 b & 4 b], it is clear that the skin fibers of the experimental enzymatic de-hairing skin in comparison to the chemical conventional method of skin shows that the fibers boundless are well-opened and cleaning the fiber network. The enzymatic process showed skin with good opening of the fibrous structure although it was not submitted to the bating step.

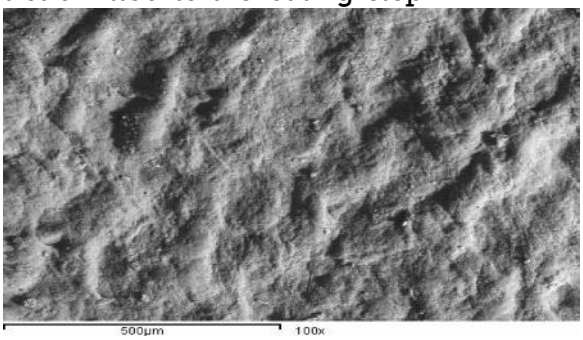

Figure (3-a): SE-Micrograph for grain surface (X100) of the enzymatic de-haired skin.

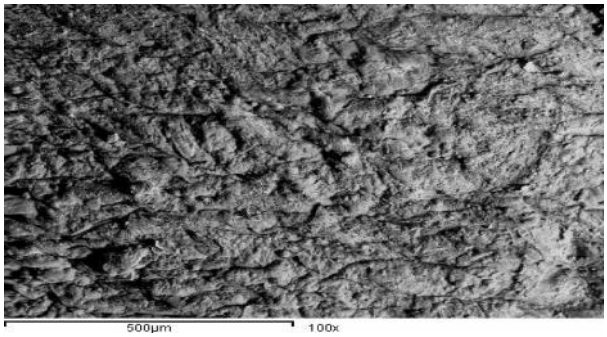

Figure (3-b): SE-Micrograph for grain surface (X100) of the chemically de-haired skin

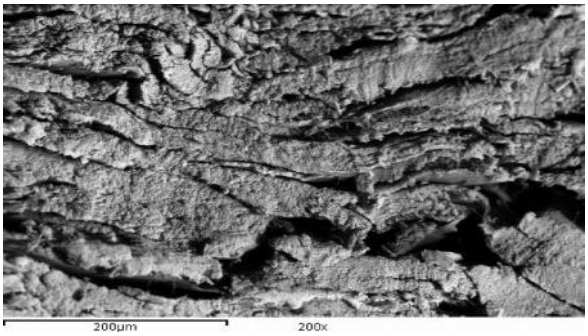

Figure (4-a): SE-Micrograph of the fiber bundles (X200) for enzymatic de-haired skin

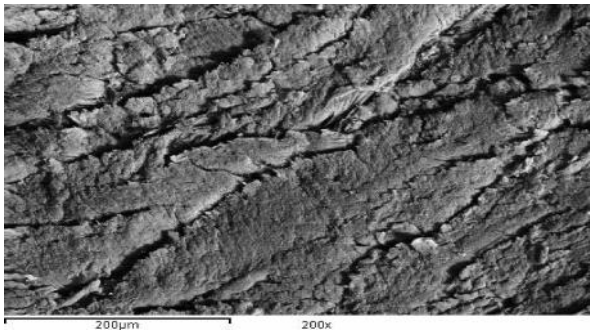

Figure (4-b): SE-Micrograph of the fiber bundles (X200) for chemically de-haired skin

Hence it is possible to infer, based on the figures earlier that enzymes provide the effect of opening collagen fibers since the beginning.

De-liming and Bating

These operations are carried out in the same vessels, where, deliming is followed by bating. The residue of non-collagen protein and other interfibrillary material are removed and leave the pelt clean as well as relaxed, ready for the tanning operation. This step can take between 30 minutes and 12 hours.

a. Traditional Process

De-liming step was carried out only in case of using lime/sulfide in de-hairing process. The purpose of the deliming step is the neutralization of the alkaline hides by conversion into readily soluble salts. Deliming value is defined as the amount of deliming agent (ammonium salt) in gram necessary for neutralizing 1 gram calcium hydroxide. Traditional methods for bating employed manure of dog dung, pigeon, and hen and pancreatic bates. These were very unpleasant, unreliable and slow methods.

b. Biotechnological Process

Bating process was carried out directly (without deliming) in case of using enzymes as de-hairing agent. Bating is the process of removing proteins other than collagen using proteolytic enzymes. Colleagues showed that bating enzymes cause physicochemical changes in the skin [50]. They suggest that the most important function of the enzymatic bate is removal of the coagulable protein of skin. [51,52], degraded hairs and promote the removal epidermis and help on carbohydrates removal. Removing the non-structured collagen improves the softness, grain elasticity and colour levelness of the leather. Even intensive bating does not impair the tensile strength much and improve the tear strength by increasing the elasticity of the fibers.

Today, both bacterial proteases and trypsin (traditional pancreatic protease) are used for bating under alkaline conditions. Enzymes used in bating step can be considered as a biological catalyst to accelerate the reactions. This opens up the pelt for the ensuing tannage. Enzymes which act specifically on proteins are called proteases, as:

a. Pancreas proteases (trypsin) [53].
b. Mould fungus proteases
c. Bacteria proteases.
d. Fungal proteases

The dis-advantages for using the enzymes in bating process are:

1. It's used at definite temperature about 30-37 °C, higher temperature cause damages of the skin material.
2. Higher concentration of natural salt reduces or inactivates the bating effect.

(To be continued to next issue)

National Conference on MSME Financing & Strengthening MSME Linkages

The 7th one day National Conference on "MSME Financing & Strengthening MSME Linkages" was held at hotel Hyatt Regency, Kolkata on 20th September' 2016. The program was organized by 'Indian Chamber of Commerce (ICC)' in collaboration with 'Brand Bishwa Bangla' of Govt. of West Bengal. It was a highly interactive seminar of this type ever, between the participants and the presenters.

In Inaugural session, after felicitation of the Dignitaries, Ms. Nayantara Pal Choudhuri, Member of the Executive Committee, ICC delivered Welcome Address, where she described the motive and role of ICC for arranging this type of Seminar on regular basis. She also explained the level of outcome gained through this type of seminar organized since last 7 years.

(From L – R) : Ms. Nayantara Pal Choudhuri (on podium), Mr. S. N. Tripathi, IAS, Mr. Rajiva Sinha, IAS & Mr. Kalyan Kar

Mr. Rajiva Sinha, IAS, Additional Chief Secretary, Department of MSME & Textiles, Govt. of West Bengal in his lecture titled "Recent Initiative of the Govt. of West Bengal" explained in details the progress and success of this department during last 5 years which has achieved a global mileage under trade name "Bishwa Bangla" with the appreciation of UNESCO and WTO. He made well acquainted the audience with the recent online portals of Bengal Government for the new and old MSME enterprisers in shake of simplification of process to obtain formal permissions and Govt. aids. He assured that proposers of MSME unit will get special benefit and advantage from Govt. though a single window system rather than any third party administration. He specially invited the Leather and Textile units which is rapidly increasing their growth from West Bengal as well as the whole eastern part of the country.

Mr. S. N. Tripathi, IAS, Additional Secretary & Development Commissioner, Ministry of MSME, Govt. of India in his address explained the recent central Govt. policies to enhance the MSME sectors which are playing a major role in employment of around 65% of workforce of the

country. He also clarified how the significance of 'Make in India' will come true through actual development of MSME sectors. He loudly praised the Govt of West Bengal regarding their recent pro-active majors taken for development of this sector and also advised the other states to follow the way Bengal Govt. is doing the job for implementation.

After the lectures a very effective interaction session took place between the two Govt. officials and the Enterprisers from the audience through knowledge and experience sharing.

However the session concluded with the Vote of Thanks offered by Mr. Kalyan Kar, Member, Executive Committee, ICC. In his speech he kept a proposal for a 'Common Minimum Agenda' (CMA) and a good Public Private Partnership (PPP) may be taken care of for real development of this sector.

After Tea Break the first Technical session titled "Banks and MSMEs : Raising the Game" started.

This session was chaired and moderated by Prof. K. Guin, Dean, Vinod Gupta School of Management & IIT Kharagpur.

In his introductory speech, Prof. Guin explained that Bank lending is considered the most common source of external finance for many MSMEs and entrepreneurs. When small business managers seek loans, it is important that they understand the logic of the lending officer's decision process in order to increase the chance of receiving credit and to understand which factors increase their chances to receive a better credit rating. While bank financing would continue to be crucial for the MSME sector, it is necessary to broaden the range of financing instruments available to MSMEs and entrepreneurs. There are several alternative sources of funding that MSMEs can tap on. However lack of knowledge and low access of financial intermediaries have been the root cause for MSMEs being bereft of access to alternate modes of financing. Policy makers and regulators would have the task of enabling these innovations to the benefit of small business.

Other distinguished speakers of this session were :

- Mr. Vikash S. Khutwad, General Manager – MSME, United Bank of India
- Mr. K. Uday Bhaskar Reddy, General Manager, Indian Bank
- Mr. M. Prasad, General Manager, Syndicate Bank
- MR. J. P. Gadia, Trade Consultant
- Mr. Ajay Thakur, Head, BSE, SME

At the end of lectures, an interaction session took place between Entrepreneurs in the audience and the Bankers on the dais.

Prof. Guin then summed up the whole session and concluded with vote of thanks to all.

Then a short but nice informative lecture by Mr. Subir Das, Dy. General Manager & Regional Manager (ER), Export Credit Guarantee Corporation of India Limited was delivered. He briefly explained the role of ECGC in development of the business of an Export house. He assured that Scope of facilitation and consultancy regarding Export finance could be available from ECGC at any point of time in case of an export house. Especially he mentioned about Leather, Textile and Engineering businesses.

Mr. Kalyan Kar, member, Executive Committee, ICC made Mr. Das introduced to the people present before starting the lecture and he summed up also with few queries from audience and concluded the session with thanks to all.

The second and final technical session titled "Marketing and Skill Development" then started.

This session was chaired and moderated by Mr. Kalyan Kar, member, Executive Committee, ICC.

In his introductory speech, Mr. Kar explained that why this topic. He said MSMEs can provide strong backbone to the growth of economy by serving as quality suppliers and vendors to larger companies across sectors. It is desirable that large procuring organizations and PSUs come forward and exchange business opportunities and also promote indigenization. Also as opposed to developed countries, where the percentage of skilled workforce is between 60% & 90% of the total workforce, India records a low 5% of workforce (20 – 24 years) with formal vocational skills. There is a need for speedy reorganization of the ecosystem of skill development and entrepreneurship promotion in the country to suit the needs of the industry.

Other distinguished speakers of this session were :

- Dr. Satyahari Dey, Managing Director, Science & Technology Entrepreneur's Park, IIT Kharagpur.
- Mr. D. Mitra, Dy Director, MSME – DI, Kolkata

At the end of the lectures, an enquiry session took place between Entrepreneurs in the audience and the Speakers on the dais.

Mr. Kar then summed up the whole session and concluded with vote of thanks to all.

With serving Lunch to the delegates the whole programme concluded for this time.

WORKSHOP CUM TECHNOLOGY TRANSFER OF "WATERLESS CHROME TANNING" FOR KOLKATA LEATHER SECTOR

Chromium is known as the king of tanning as it is widely used for tanning. Out of 18 billion sq. ft. of annual global leather production, about 16 billion sq. ft. is made using chromium. The average uptake of chromium by the pelt during tanning is only about 60% out of the chrome tanning agent offered. About 40,000 tons of BCS is discharged globally by the leather industry every year.

In India, about 800,000 tons of animal hides and skins are converted into leather every year. About 70,000 tons of basic chromium sulfate (BCS) is used by the tanning industry annually in India. And about 20,000 tons of chromium tanning agent is discharged along with the wastewater. Apart from the economic loss, the environmental impacts associated with this are very significant. The known methods of chrome management such as chromium recovery and reuse, direct chromium liquor recycling and use of high exhaust chrome tanning agent are associated with certain disadvantages. CSIR-CLRI had developed a 'Waterless Chrome Tanning Technology' (WLCT) under the 12th Five-year plan project namely 'Research Initiative for Waterless Tanning' (RIWT).

According to the waterless chrome tanning technology, which has been patented by CSIR-CLRI in India, chrome tanning is carried out without water. And, pickling and basification are averted. Penetration and fixation is achieved equivalent to the conventional chrome tanning method. Apart from addressing the issue of chromium discharge, this technology also brings about the benefits of reduction in total dissolved solids load. The quality of leathers thus produced is also found to be better than the leather produced in the conventionalmanner.

For a tannery producing wetblue from 5 tons of hide will be able to save about Rs. 1 Lakh per month by means of reducing the chromium offer and also through dispensing with chromium recovery. Therefore, this technology provides viable solution to address the issue of chromium and additionally brings about financial benefit.

CSIR-CLRI has taken the initiative of marketing this technology. On June 5, 2016, marking the World Environmental Day, Erode Tannery Owners' Association and CLRI organized the workshop on 'Roadmap on Sustainable Growth of Erode Leather Sector' and a MoUwas signedto transfer the pickle-free waterless chrome tanning technology in the tanneries of Erode. In Kanpur leather sector demonstration of the technology at commercial scale has been conducted in three tanneries and the workshop was conducted on28th July 2016. Many tanneries in Kanpur have entered into agreement with CLRI in obtaining the license of the technology. Then, in Jalandhar the demonstration has been completed in three tanneries between 29th August and 1st September 2016 and the workshop was conducted on 31st August 2016.

It is proposed to conduct the demonstration followed by the workshop in Kolkata.

(Source: Email from Dr. Dipankar Chaudhuri, RCED, CLRI, Kolkata)

BATA EMPLOYEE UNION SEEKS INVESTMENT TO RAISE PRODUCTIVITY

In a refreshing change, the employees union at Bata India's Batanagar factory near here has asked the management to invest and modernize the unit to improve productivity at the company's oldest facility. "We have asked the Bata management to invest and modernize the Batanagar factory for raising productivity and also to recruit more people on the rolls," said Subir Chakraborty, General Secretary of Bata Mazdoor Union, the sole bargaining agent at the (Batanagar) factory.

The union comprises elected members from major political parties like Trinamool Congress, Congress and CPI(M). He said that the factory, which was set up more than 80 years back, was still the biggest facility of the company.

Bata India, which also has manufacturing units at Patna, Bangalore and Faridabad, once manufactured 3.5 crore pairs per year at the Batanagar factory. Now, the production at the factory has come down to almost one crore pairs a year, but more than the combined output of all the other units, he told reporters here on Thursday.

"We are happy that the management has started investing in the factory and we assure that there will be no problem in future," he said. Bata India, which started from Kolkata, later shifted its headquarter to Gurgaon following major trade unionism issues."

The Batanagar unit was employing 1,574 workers and another 1,000 indirectly. "It is the interest of West Bengal that the Batanagar factory should flourish," he said.

(Millenium Post – 26.08.2016)

ZERO TOLERANCE FOR TANNERIES DISCHARGING WASTE IN GANGA : GOVT.

A "zero tolerance" policy would be adopted towards the waste being discharged into Ganga river from tanneries, Union Environment Minister Anil Madhav Dave said today even as he asserted that some issues needed to be dealt "strictly".

Noting that the discourse should not be about saving the Ganga but serving it, he stressed the need for creating a "social involvement" in the issue and said the government is holding consultations and working in the right direction.

"If we bring a wrong medicine in the house, we do not consume it by saying since we brought it and we have to consume it. In some matters related to Ganga, there is a need to be strict. There are some issues related to Ganga which are so concerning, tanneries being one of them, in which one has to be maintain zero tolerance. Neither treated not treated (water). Government is thinking about all these issues and working in the right direction," Dave said when asked about Government's policy on existing tanneries. Noting that Ganga become very dirty and everybody is responsible for this, he said Prime Minister Narendra Modi monitors it at frequent intervals. "We should not talk about saving Ganga but we should talk of serving it. Ganga has been there for lakhs of years and will continue to do so. If you use wrong words, your approach will change," he said.

Noting that people, cutting across political lines, want the river to be clean, Dave said there was a need to involve the society in the issue. "There should be social involvement," he said, adding that there have been many rounds of consultations with Water Resources Minister Uma Bharti over the issue and the government is working on it.

He said politician Madan Mohan Malviya's agreement with the British, about the uninterrupted flow of Ganga in Haridwar, are relevant even today and the ministry wants to implement it.

(Times of India – 12.08.2016)

VIETNAMESE MAKE SHOES TO EXPORT, NOT TO WEAR

The footwear shops on Nguyen Trai Street in district 1, HCM City were crowded last May holiday : Saigonese flocked to the shops to buy under the 'buy 1 and get 1 free' sale promotion program. However, these shops only sell foreign made shoes bearing Clarks, Dr. Martens and Converse brands, not Vietnamese shoes.

According to the Vietnam Leather, Footwear and Handbag Association (Lefaso), imports account for 60 percent of the domestic market share.

Why is the Vietnamese footwear industry, with 800 enterprises which churn out 1,172 million pairs of products, the third largest exporter in the world in 2015, just after China and Italy, unable to satisfy the Vietnamese requirements ?

The answer to the question can be found in the list of nominated product items for the Vietnamese High-quality Products title. The number of enterprises eligible for the title is so modest that they can be 'counted on one's fingers', namely Biti's, Thuong Dinh, Hong Thanh, Asia Private Enterprise, Vina Giay, Bita's, Long Thanh and BQ Production & Trade.

Meanwhile, not all the enterprises which obtain the title can conquer consumers' hearts. Biti's is a typical example. Once holding a very large domestic market share, its products are no longer favored because of the lack of diversity of designs.

The same thing is occurring with Vina Glay. The slow changes in designs keep young people away, while Vina Giay shoes are mostly used by middle-aged people who like durable products. Since there are not many choices, the youth, a large group of consumers, prefer wearing imported products.

Even Thailand, which never had advantages in shoe manufacturing, has also been trying to penetrate the Vietnamese market by displaying products at Thai good trade fairs and exhibitions. An analyst commented that in the near future, more and more Vietnamese would wear Thai shoes, especially when Thais now control 50% of the Vietnamese retail market share.

The analyst noted that Vietnamese shoe manufacturers, who have been aware of the danger, have begun to focus on exploiting the domestic market. It's better later than

never. Biti's, for example, has marketed Hunter, a sports shoes brand, to compete with foreign giants like Adidas, Nike and Puma. According to Biti's, the company has spent US $5 million on machines and equipment to make the products.

(Culled from Net- 14.08.2016)

INDIA CAUTIONS TRADERS ABOUT FRAUD IN IMPORT-EXPORT FROM CHINA

Indian diplomatic missions in China have cautioned traders from India that they may end up getting sand, stones, salt, bricks, mud etc. in place of items ordered and issued detailed guidelines to avoid incidents of cheating. The Indian Embassy and the Consulates have issued trade advisories to various trade bodies and associations cautioning traders and small and medium enterprises (SMEs) planning to do business with China after receiving several complaints.

"It is to enhance the commercial cooperation between India and China by drawing attention to some of risks faced by Indian traders/SMEs to take preventive and/or mitigating action," said the advisory.

"The information contained in this advisory is based on trade-related problems that are periodically brought to the Consulate's attention for information, facilitation and assistance," according to the advisory circulated among the members of the Indian Association of Shanghai. However, the advisory was not put on the website of the Indian missions in China to avoid misunderstanding considering the strain in ties due to differences on issues relating to listing of Pakistan-based militants and groups as terrorists by UN and Beijing's reluctance to support India's application to join the Nuclear Suppliers Group, informed sources said. Listing some of the complaints brought to the notice of missions, the advisory said importers should be careful about supply of sub-standard goods, inferior quality.

The items to dupe Indian importers included supply of sand, stones, salt, bricks, mud etc. in place of chemicals, Silicon Carbide, Aluminium and Zinc ingots, shellac, plastics, polymers etc., it said. Other complaints included refusal to send consignments on receipt of payment, quantity dispute, stopping of communications on receipt of advance payment, dispatch of defective machinery, diversion of payment into unassociated bank accounts by third fraudulent parties by hacking into email IDs. Other methods included taking money for sample dispatch and then stopping all correspondences. The Indian exporters should be careful about refusal to make payment after taking control of consignment exported from India on some pretext and refusal to take delivery of the consignment when the market value of the imported item has gone down from the value fixed in agreement, it said.

(Moneycontrol – 27.08.2016)

RAJYA SABHA PASSES BILL ON CHILD LABOUR

Rajya Sabha on Tuesday passed a Bill which prohibits employment of children below 14 years in all occupations or processes except where the child helps his family, with the provision for imprisonment up to two years for any violation.

'The Child Labour (Prohibition and Regulation) Amendment Bill' makes employment of children below

14 years as cognizable offence for employers and provides for penalty for parents. The Bill, which was almost unanimously passed voice vote, defines children between 14-18 years as adolescents and lays down that they should not be employed in any hazardous occupations and processes.

It provides for enhanced punishment for violators. The penalty for employing a child has been increased to imprisonment between 6 months and two years (from 3 months to one year) or a fine of Rs.20,000 to Rs.50,000 (from Rs.10,000-20,000) or both. The second time offence will attract imprisonment of one year to three years from the earlier 6 months and two years. According to provisions of the Bill, no child should be employed in any occupation or process except where he or she helps his family after school hours or helps his family in fields, home based work, forest gathering or attends technical institutions during vacations for the purpose of learning.

Hailing the development as a "historic" step, Labour Minister Bandaru Dattatreya said it is aimed at "total abolition of child labour". Explaining the exception, Dattatreya said that 'family' has been exempted as the relationship between employer and employee does not exist and that a law should be framed keeping in mind the ground realities as well as ensuring that it is implementable.

Earlier, participating in the debate on the Child Labour Bill, Satyanarayan Jatia (BJP) stressed the need for proper coordination among three ministries responsible for formulating schemes for welfare of children. Three ministries – Human Resources Development, Women and Child Development and Labour – should come out with composite schemes for welfare of child labour and trade unions should be consulted while formulating these, Jatiya said. 'Matter of Shame'

Ravi Prakash Verma (SP) alleged, "India has become an organized system for exploitation of children" and "it is a matter of shame" that government is working in piecemeal. He alleged that unfortunately the government is pressing for the Bill despite a Parliamentary Standing Committee saying that changes are not good.

A Navaneethakrishnan (AIADMK) rued that recommendations of parliamentary standing committee on Labour has not been incorporated in the Bill. Vivek Gupta (Trinamool) said while agriculture has been put under non-hazardous category in the Bill, it involves hazards like spray of pesticide. He added that family enterprises like carpet weaving, beedi making too were hazardous for the children.

Jharna Das Baidya (CPI-M) said her party strongly opposes the Bill as it is a move towards legalizing child labour. "We are opposing the bill as it is an exit road by the government to allow children to work," she said. Shaadi Lal Batra (Congress) stressed on providing education to children so that they could earn money and support family, and do not get engaged in anti-social activities. He said 40 per cent families fall in the BPL category and they find it difficult to send their children for studies.

D Raja (CPI) said he was "very strong reservations" on the Bill and wanted it to be referred to the Select Committee for further scrutiny. He too asked the government to clarify the definition of 'Hazardous Occupation' as well as to elaborate on the definition of 'Family Enterprise'. Renuka Chowdhury (Congress) said child labour is an "oxymoron" as associating child with labour is in itself destroying childhood.

She too raised the issue of the definitions of 'Hazardous Occupation' from 18 to 3 and asked the government to explain.

(P T I – 28.08.2016)

JOB CREATION IN LABOUR INTENSIVE EXPORT ORIENTED SECTORS DOWN 68%

Job creation in labour-intensive and export-oriented sectors, including textiles, automobiles, IT/ BPO, declined 67.93 per cent in 2015, with net addition of employment coming down to 1.35 lakh during the year, Parliament was informed.

"According to Labour Bureau's Quarterly Employment Survey (QES), estimated employment experienced a net addition of 4.21 lakh (persons) and 1.35 lakh (persons). In January 2014 to December 2014, and January 2015 to December 2015, respectively," Commerce and Industry Minister Nirmala Sitharaman said in a written reply in Rajya Sabha. The estimated employment for export-oriented sector saw a net addition of 1.22 lakh persons in January-December 2015, she added.

The Labour Bureau conducts quarterly QES in select labour-intensive and export-oriented sectors such as textiles, including apparel, metals, gems and jewellery; automobiles, transport; IT/BPO; leather and handloom/powerloom to assess the effect of economic slowdown on employment in India.

She said data pertaining to the whole of manufacturing sector is not collected under the QES of the Labour Bureau.

"However, out of the right selected sectors, textiles, including apparels, metals, gems and jewellery; automobiles; leather and handloom/powerloom are part of the manufacturing sector," she added.

(P T I – 29.08.2016)

IS MEGHALAYA BOOSTING BANGLADESH'S LEATHER EXPORT MARKET ?

Almost every other day, we come across incidents of BSF personnel apprehending cattle smugglers from the highly porous Indo-Bangladesh border line in Meghalaya. Despite efforts by the Border Security Force (BSF) to curb cattle smuggling, there seems to be no end to this menace.

It may be noted that India shares a 4096 km (2545 miles) border line with its neighbor Bangladesh. Out of this entire area, Meghalaya comprises of 445 km border area with the country. This highly porous border line provides an easy haven for smugglers to carry out their black trade. It may also be taken into consideration that Bangladesh has a flourishing export trade with respect to leather and its products, most of it being demanded by the Gulf and South Asian Nations.

Now, tallying the number of arrests made by BSF of cattle smugglers along the border and the flourishing export trade in Bangladesh, one can easily make a guess as to why something concrete is not being done in this regard. The issue of barbed-wire fencing may have come up time and again but the weighty land dispute issue seems to bury the fencing issue deep

down under. Or may be the land issue is only a scape-goat to direct the focus of people from the menace to another unresolved burning matter.

As per a report in an English Daily, the cattle-heads smuggled from India are sold at prices four times higher in Bangladesh and most of the exports are made to the Gulf and South Asian Nations. It was also reported that if a cattle head is brought in India at around Rs.10,000, the same would be sold at Rs.45,000 approximately in Bangladesh. As per records, BSF apprehended as many as 563 cattle heads in 2014, 2064 cattle heads in 2015 and 1203 cattle heads in 2016 till date. Hence, we see an exponential increase in the numbers over the years.

Clearly, an increase in the number of cattle head smugglers apprehended over the years is directly proportional to the increase in the export trade in Bangladesh. With this unabated rise in the menace, it is but worthy to note that the unchecked smuggling, porous border and a not-so-effective vigil exposes not only Meghalaya but the entire nation to various other allied threats that need no mention to a sensible man.

Yes we knoe that India and Bangladesh are moving closer towards better relations, but at what cost? This needs a moment of thought and focused actions on pertaining issues that matter.

(TNT-The Northeast Today – 23.08.2016)

HELP FOR BENGAL INDUSTRIAL PARKS

Kolkata. July 16 : The department of industrial promotion and policy (DIPP) has assured support to Bengal to upgrade its industrial and leather parks. The DIPP may also offer a package for the modernization.

"There is no reason why Bengal will not become one of the principal hubs of industrial growth in the country. Once the Amritsar – Calcutta dedicated freight corridor becomes operational – most probably by March – 2019 there will be a sea change in the state's industrial climate," DIPP Secretary Rames Abhishek told industry members at a closed door session organized by the CII Eastern Region here today.

With the Centre's start up action plan ready to be rolled out, Abhishek asked the state to be participant.' DIPP is there for help.

(Telegraph – 17.07.2016)

BATA CONCENTRATES SAME STORE GROWTH

Bata India has changed its strategy of opening over 100 stores a year and would start concentrating on same store growth, a top company official said on Thursday. It also plans to set up online kiosks in some major retail stores across the country.

"...company has changed its strategy of opening 100 plus stores every year and is now concentrating more on achieving same store growth," said Chairman, Uday Khanna. The shoe maker added 26 new retail stores during the last financial year, he told shareholders at the company's 83rd annual general meeting. "The company is planning to set up online kiosks in some of the major retail stores across the country wherein customers shall have the option to buy footwear of their choice online," Khanna said.

The company continues to penetrate into tier 2 and tier 3 cities in India and other rural markets, he said. The footwear maker has been investing to strengthen its digital multi channel business division along with logistics division with due importance for delivery of footwear and accessories, its latest annual report said. In 2015-16, online sales reached Rs.40 crore.

(Punjab Tribune.com – 04.08.2016)

Made a mistake in your tax return? Here's how to correct it

Taxpayers are usually careful and exercise due diligence while filing income tax (I-T) returns. But sometimes in a rush to file their tax returns within the due date of 31st July (extended to 05th August this year), they end up making mistakes. Among the common errors are unclaimed deductions or an income not reported or reported incorrectly. One's contact details or the bank account given for the refund of taxes could also be wrong. However, if you have filed your return within the due date, then you need not worry as you can revise your return.

A major reason why taxpayers have to revise their returns is that they are not aware of the recent changes in tax rules, which result in incorrect filing of returns. For example, according to the latest tax laws, "this year the taxpayer whose income exceeds Rs 50 lakh per annum had to file a declaration about his/her assets and liabilities. However, only a few taxpayers might have reported this due to their ignorance. In such cases, they still have an opportunity to rectify their mistake by filing a revised return," says Vaibhav Sankla, Director, H&R Block India.

Who can file revised returns?

Of the many advantages of submitting your I-T returns timely, the most important is that it can be revised. However, "to make your revision process smooth, it's better not to verify a return - if that has been filed online — you wish to revise. That is because once a return is verified; the Income Tax Department begins processing it. Therefore, correct your errors when you notice them, review your return properly and submit your revised return," informs Archit Gupta, founder and CEO, cleartax.com.

So if you notice any error in your tax return after filing it, you better file a revised return correcting the error to avoid any penalty. Income tax laws allow the taxpayers an opportunity to correct the error or omission in their returns by submitting a revised tax return under Section 139(5).

"The provision clearly states that any person who has filed the original tax return on or before the due date can file a revised tax return before the expiry of one year from the end of the relevant assessment year, or before the completion of assessment, whichever is earlier. For example, if a person has filed his original return for the financial year 2015-16 within the due date, then he can file a revised return before March 31, 2018 or before the completion of the assessment of the financial year, whichever is earlier," says Nitin Baijal, Director, BMR & Associates LLP.

One good news, is that starting the next AY 2017-18, the Income Tax Department has allowed revision of belated returns (returns which are filed after the due date) as well.

How many times can you revise your return?

If you have filed your tax return for FY 2015-16 on or before 5th August, 2016, then you can file a revised return any number of times up to 31st March 2018. "Though one can revise one's tax return any number of times, but the facility should be used sparingly as it may increase the chances of your return being selected for scrutiny, especially if it is resulting in large refunds for you. Revision is allowed only if the omission was unintentional, but if you deliberately

file a false return, then you will be liable to be imprisoned under Section 277 and the offence will not be condoned by filing a revised return. Further, you may also have to pay 100 to 300 per cent of tax due as penalty for concealing income," says Sankla.

According to him, in case the revision of original return results in some taxes payable, you may have to pay the interest under Sections 234C & 234B (levied for non-payment of advance taxes), but you will be saved from the interest under Section 234A (levied for non-filing of tax return within due date). You can pay such interest and taxes through Challan No. 280. Also make sure that you enter the details of such challan in the revised return, else it will be considered a defective return owing to additional tax payable.

How to file a revised return?

For filing the revised return, you will be required to enter the acknowledgement number and the date of filing of the original return in the revised form. If you are filing a revised return more than once, then at first and every subsequent revision you will have to enter the acknowledgement number and the date of filing relating to the original return only. You can file a revised return online or through physical mode.

You can revise a return online only if you have filed the original one online and have the 15-digit acknowledgement number of the original return sent to you by the I-T Department. "Your return can be revised with any of the e-filers, irrespective of whether you filed your original return with them or not. Incorporate the omission in your return, then review and check all the fields, including those where there was no change. If the changes result in a tax due, you must pay this tax before submitting your return," says Gupta.

Verifying your returns

A revised return filed online must be verified. You can verify it via several methods provided by the IT department including netbanking or Aadhaar OTP (One-time Password). You can also send the physical ITR-V to CPC, Bangalore. However, remember to send the ITR-V of the revised return. ITR-V is sent as an attachment by the I-T Department to your registered email ID after you successfully upload/file your return online.

It is always in your best interest to file your original I-T return with utmost care, avoiding the chances of any error or omission. You can, however, still use the opportunity provided by law to rectify mistakes in your return, if any, before it is too late.

Since 1950

LESA

LEATHER SCIENCE ABSTRACTS

VOLUME 49 **NUMBER 09** **SEPTEMBER, 2016**

NATIONAL INFORMATION CENTER FOR LEATHER & ALLIED INDUSTRIES (NICLAI)
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LEATHER SCIENCE AND TECHNOLOGY

LEATHER INDUSTRY, HISTORY, MANAGEMENT, ECONOMICS, EDUCATION

49.14927

The long-term outlook for chemicals : Building the next wave of middle-class growth. PRYOR (S), (M/s. Exxon Mobil Chemical Company, No. : 22777 Springwoods Village, Parkway, Spring, Texas 77389-1425, USA). (Chem. Wkly; 59, 41; 2014, May, 20; 195-8).

Speaks an interesting juxtaposition viz. : a connection between chemicals and the developing world's middle class and furthermore, how the United States can strength its own middle class by capitalizing on shale energy to meet global chemical demand. (2 Photos).

49.14928

Making India a hub of chemical engineering : Conquering challenge. GODREJ (N), (M/s. Godrej Industries Limited, Godrej One, Pirojshnagar, Eastern Express Highway, Vikhroli, Mumbai-440 079, India). (Chem. Wkly; 59, 42; 2014, May, 27; 203-4).

It is appeared that nothing seems to be preventing India from becoming a hub of chemical manufacturing and also being present across the complete value chain in chemicals among Asian countries with the challenges conquered through a sustained effort by all the stakeholders. (3 Photos).

49.14929

Oil field services and chemicals industry : New technologies open up growth opportunities - Part 1. RAJAGOPAL (R), (M/s. "Chemical Weekly", Corporate Office, No. : 602, 6th Floor, B-Wing, Godrej Coliseum, Behind Evarard Nagar, Off. : Eastern Express Highway, K.J. Somaiya Hospital Road, Sion(East), Mumbai-400 022, India). (Chem. Wkly.; 59, 42; 2014, May, 27; 179-82).

Discusses the global oil field services (OFS) and oil field chemicals(OFC) industry that has seen radical changes in the last decade-spate of merges and acquisitions(M&As), new discoveries, emergence of shale gas, advances in offshore exploration and production technologies and emergence also of a new generation of eco-friendly oil field chemicals. These developments have been influenced primarily by regulations and geo-political developments. Analysed some of the major developments in this segment. Part 1 of this two-part feature focuses on global trends in this oil field services and chemicals industry and analyses emerging technology, product and service trends. (2 Photos).

49.14930

Oil field services and chemicals industry : New technologies open up growth opportunities-Part 2. RAJAGOPAL (R), (M/s. "Chemical Weekly", Corporate Office, No. : 602, 6th Floor, B-Wing, Godrej Coliserum, Behind Evarard Nagar, Off. : Eastern Express Highway, K.J. Somaiya Hospital Road, Sion(East), Mumbai-400 022, India). (Chem. Wkly.; 59, 42; 2014, May, 27; 179-82).
The second part of this two-part feature focuses on current trends in Indian oil and gas sector and emerging trends in the India industry, research and technology status and new advances in oil field chemicals.

49.14931

CII's pre-budget memorandum 2014-l5 : Recommendations on indirect and direct taxes. (Chem. Wkly.; 59, 42; 2014, May, 27; 211-7).

Presents some of the key recommendations on taxes and duties pertaining to the chemical and allied sectors. (6 Photos).

49.14932

Ease the squeeze on profitability with effective energy management. GHOSH (A), (South Asian Division, M/s. AspenTech SP Infocity, Survey No. : 209 Pune-Saswad Road, Phursungi, Pune-412 308, Maharashtra State, India). (Chem. Wkly; 59, 42, 2014, May, 27; 207-9).

Discusses in detail about the effective energy management, which is not an one-off project or one area of the business, for reducing energy usage and associated green house gas emission which is a widely recognised business requirement for energy process manufacturers and delivers tangible business benefits. (2 Photos).

49.14933

Pharma Manufacturing-Need for improved global manufacturing efficiency to meet rising demand for emerging economies : Over 70% of industry is actively investing in manufacturing techniques and technologies. (Chem. Wkly.; 59, 41; 2014, May, 20; 191-4).

CPhI Pharma Insights Manufacturing Report examines the current trends in continuous process improvements and evaluates practices that have been implemented across the industry to drive increased product quality and greater cost efficiencies. The results show that industry hopes to see more continuous improvement models implemented over the next few years, to mirror the growing need to drive greater manufacturing efficiencies and cost reductions. (2 Tab.; 7 Fig.; 2 Photos).

49.14934

Gap in the market. SAIDDAIN (A), (Marketing and Operations Division, M/s. Royal Leather Industries Limited, No. : 26-B, Sundar Das Road, Zaman Park, Lahore-54000, Pakistan). (Leather Int'l; 216, 4840; 2014, May; 4&6).

Addresses the leather skills gap and discusses how human capital shortages, despite the demand leather, are increasing. (1 Tab.).

49.14935

Product Carbon Footprint(PCF) & SGS's global product carbon footprint marks. MUTHU (K), (Global Sustainability Services, M/s. SGS(HK) Limited, No. : 17/F, The Octagon, 6 Sha Tsui Road, Tsuen Wan, Hong Kong). (Leather News India; 5, 5; 2014, May, 47-8).

Climate change is becoming one of the biggest long-tem challenges to the society perhaps in the recent decades. Most organizations are thinking of possible solutions to reduce green house gas emissions and becoming part of their commitments of sustainable business. The need of product footprint calculations to be always considered as the initial step for managing the greenhouse gas emissions that could be found everywhere within the business operations and the manufacturing processes systematically. (1 Tab.).

49.14936

Studies on Ethiopian sheepskins as an opportunity for value addition-Part II : Optimization and characterization of Wanke upper and garment leathers. MOHAMMED (H), AYSANEW (G), ARAVINDHAN (R), GNANAMANI (A), RAGHAVA RAO (J), CHANDRA BABU (NK), (Council of Scientific and Industrial Research-Central Leather Research Institute(CSIR-CLRI), Adyar, Chennai-600 020, India). (J. Am. Leather Chem. Assoc.; 109, 5; 2014, May; 161-70).

Ethiopian tanners face a shortage of raw-material input for the production of leather. The government strategically planned for importing raw skins from neighbouring countries and also for effective utilization of available raw material resources in the country. The meat of Wanke sheep is in high demand in international markets, but the skin commands low price not only due to low availability but also less demand by tanners due to natural problems associated with the skin. Hence, tanners treat the skin as a reject. The problems of Wanke skin include high natural fat deposition, thin substance and low strength. Usually, leathers made out of Wanke skins have low selections compared to Ethiopian sheep skins and are mainly utilized for making lining leather. Efforts have been here to develop a process technology for making high value leathers with improved properties from Wanke sheepskins. (7 Ref.; 7 Tab.; 3 Fig.).

49.14937

Wrong number. SETTER (S), (Leather Int'l; 216, 4810, 2014, May; 18&20).

A survey had been done and its results had very clearly proved that the author was not to be easily misled and took the figures to task, delivering deeper to find the truth behind the most up-to-date leather industry statistics. (1 Photo).

49.14938

A futuristic vision on the development of the leather sector in Paschim Bongo, India. DASGUPTA (S), (No. : 1111, South Wabash Avenue, Chicago-60605, USA). (J. Indian Leather Technol. Assoc.; 64, 5; 2014, May; 460-74).

Aims the indication, of the newer approaches to the leather industry in India and in particular in Paschim Bongo. The main approach is to focus and align the leather industry as a part of the emerging biotechnology and nanotechnology based industry and therefore production should be refocused to the use of the valuable collagen and other proteins, derived from locally available hides and skins. The re-orientation changes significantly the focus away from the production of low-value leather and leather products to high value upholstery leather and aviation and automobile industries and towards the use of collagen for high value non-leather products, like collagen for medical purposes like burn-treatments aids, wrinkle repair, surgical threads, reconstituted collagen for wider industrial use, like gelatin, hair-care products and bio-regardable resins, to mention a few. As a part of this newer focus, this is being suggested that (a) the leather industry in Paschim Bongo should be aligned with biotechnology and nanotechnology based industry; the training of leather technologists should be brought under the overall umbrella of Nanotechnology, Biotechnology and Bioprocessing engineering and the graduates from the Leather Technology courses should be further trained for various specialized courses leading to Master/Ph.D. so that they are well equipped to handle the newer demands on analytical and protein regeneration science & technology for the expected future structural changes in this sector. (35 Ref.; 3 Tab.).

49.14939

Publication ethics. RAVI (M), (Department of Human Genetics, Faculty of Biomedical Sciences Technology and Research, Sri Ramachandra University, Porur, Chennai - 600 116, India). (Scitech J.; 1, 5; 2014, May; 3). Highlights the publication ethics as pertaining to the manuscripts that are being submitted to a journal.

RAW HIDES AND SKINS

49.14940

Some bygone leathers and their reincarnations. DEWHURST (J), (M/s. Claytons, Clayton Street Tannery, Chesterfield, Derbyshire S41 0DU, England). (J. Soc. Leather Technol. Chem.; 98, 6; 2014, Nov.-Dec.; 243-7).

Introduces leather as a simple piece of chrome- or vegetable-tanned hide or skin without realising that there is an amazing variety of tannages. Some of these hides or skins are ancient and others as recent as the industrial revolution. Some are brand new as in the latest automotive leathers. Mentioned few of this whole plethora in the author's speech which has formed this paper. (11 Ref.).

49.14941

Application of N-(2-Hydroxy)propyl-3-trimethyl ammonium chitosan chloride as an antibacterial and antifungal in wet-blue cattle hides. DAN (N), ZHU (J), XIAO S), DAN (W), (National Engineering Laboratory for Clean Technology of Leather Manufacture, Sichuan University, Wangjiang Campus, Section No. : 24 of Southern Yichuan, Chengdu 610065, Sichuan Province, People's Republic of China and Key Laboratory of Leather and Engineering of Ministry of Education, Sichuan University, Chengdu 610065, People's Republic of China). (J. Soc. Leather Technol. Chem.; 98, 6; 2014, Nov.-Dec.; 264-8).

Describes N-(2-Hydroxy) Propyl-3-Trimethyl Ammonium Chitosan Chloride (HTCC) that has better water-solubility than Chitosan (CS) and its solubility no longer depends on the change of solvent *p*H. The minimum bactericidal concentration (MBC) of HTCC to *Escherichia coli(E.coli)* is 6 g/L whereas the MBC for CS is 9 g/L and the value for *Staphylococcus aureus(S.aureus)* is 3g/L for HTCC for antibacterial and antifungal effects. Investigated the inhibition against *Escherichia Coli, Staphyloccus aureus, Aspergillus niger, Aspergillus flancs* and blue mould through an orthogonal design. The results showed that the treated wet-blue cattle hides possessed good antibacterial and antifungal properties. Correspondingly, the optimum treating conditions of the antibacterial process were a float of 100% with a dosage of 0.4% at *p*H 4.0, below 50°Centigrade, reacting for 1.0 hour. The optimized antifungal process was a float of 150% with dosage of 0.2% at *p 5.05.05 p*H 5.0, below 40°Centigrade, reacting for 2 horo urs. (7 Ref.; 1 Tab.; 8 Fig.).

49.14942

Salt determination in salted bovine hide. JAUME (S), MERC (S), JOSEP (MM), (Chemical Engineering Department, Igualada School of Engineering, Universitat, Politecnica de Catalunya(UPC), Plaça del Rei, 15.08700 Igualada, Spain). (J. Soc. Leather Technol. Chem.; 98, 6; 2014, Nov.-Dec.; 248-52).

Describes a simple and inexpensive method that has been developed to determine the amount of salt contained in a salted raw hide. Tested two different systems of analysis. Salt is removed by stirring the hide with deionized water in both methods and analysing the resulting salt both. The first method is based on the measurement of the chloride amount in the salt bath by the Mohr method. The second method is based on measuring the density of the salt bath. The second method has yielded very good results. Also, it does not require the use of chemical reagents and the necessary equipment is common in all tanneries. (14 Ref.; 7 Tab.; 2 Fig.).

ENZYMOLOGY

49.14943

Covalent immobilization of organophosphorus hydrolyse onto insoluble bovine collagen fibres. LI (Y), JIA (X), PENG (B), (Key Laboratory of Leather Chemistry and Engineering of Ministry of Education, Sichuan University and National Engineering Laboratory for Clean Technology of Leather Manufacture, Sichuan University, Wangjiang Campus, Section No. : 24 of Southern Yichuan, Chengdu 610065, Sichuan Province, People's Republic of China). (J. Am. Leather Chem. Assoc.; 109, 6; 2014, Jun.; 197-206).

An organophosphorus hydrolyase(OPH) was prepared and partially purified from *Flavobacterium sp.* The crude enzyme, with an activity of 1030U/g, was immobilized onto insoluble bovine collagen fibres(hide powder), instead of collagen membrane, through glutaraldehyde coupling. Investigated the optimal conditions of enzyme immobilization and properties of the immobilized enzyme preparations. Non-tanned hide powder showed higher immobilized enzyme activity. The optimal enzyme immobilization conditions are namely (a) 10 mg of enzyme was immobilized onto 500 mg of hide powder in a 50 mM phosphate buffer of *p*H 7.5 at 200°Centigrade and 20% glutaraldehyde offer(based on the hide powder weight) was used to couple the enzyme and collagen fibres. The enzyme activity yield was about 35% and the hide powder immobilized OPH (Organophosphorus Hydrolase) has an enzyme activity of about 7U/g. The immobilized enzyme showed the same temperature and *p*H profiles as the free enzyme and it performed at much higher *p*H and with better thermal stability. The Km value of the immobilized enzyme was a somewhat higher(0.388 mM) than that of the free enzyme(0.215 mM). The reusability test showed that about 85% activity was retained after 10 use cycles. The residual activity of the immobilized enzyme preparation was 98%. (20 Ref.; 4 Tab.; 13 Fig.).

49.14944

Limb remote isochemic post-conditioning reduces brain reperfusion injury by reversing eNOS uncoupling. CHEN (G), YANG (J), LU (G), GUO (J), DOU (Y), (Department of Pharmacology of Chinese Materia Medica, China Pharmaceutical University, 24 Tong Jia Xiang, Nanjing 21009, Jiangsu, China). (Indian J. Exp. Biol.; 53, 6; 2014, Jun.; 597-605).

Limb remote isochemic post conditioning (LRIP) can reduce isochemia-repercussion injury(IRI), but its mechanisms are still unclear. Hypothesized the LRIP, that reduces IRI by reversing eNOS(endothermal nitric oxide synthase). Focal isochemia was induced in Sprague-Dawley rates by middle celebral artery occlusion for 2 hours followed by a 24 hours reperfusion. Folic acid(FA) was administered to the drug treatment group by gavage for 11 days, before this surgery. Behavioural testing, vascular function, nitric oxide(NO) concentration and superoxide dismutase activity in the serum were determined after a 24 hours reperfusion. In addition, the infarct size of the brain was also detected. The messenger ribonucleoroacid(mRNA) of eNOS, GTPCH(Cyclohydrolase**I**, $P22^{Phox}$ and xanthine oxidase(XO) in the ischemical region were detected by reverse transcription-polymer chain reaction(RT-PCR) and introtyrosine(Tyr-NO_2) was detected using Western blot analysis. The results showed that LRIP, FA and FA+LRIP all could improve behavioural score and increase NO-mediated endothelium-dependent vasomotor responses, reduce infarction of rats subjected to IRI. Western blot and RT-PCR analyses showed that the Tyr-NO_2 levels and the mRNA expression

of nicotinamide adenine dinucleotide phosphate(NADPH) oxidase catalytic subunit $P22_{phox}$ and NO were up-regulated in the isochemic brain, which was significantly inhibited by LRIP, FA and FA+LRIP. The mRNA expression of the rate-limiting enzyme in tetrahydrobiopterin(BH_4) synthesis. GTPCH, was down-regulated in the ischemic brain, which could be significantly augmented by LRIP and FA+LRIP. It is concluded that IRI induces eNOS uncoupling in the cerebral ischemic region and LRIP partially reverses the eNOS uncoupling induced by IRI. (42 Ref.; 15 Fig.).

49.14945

Insulin secreting and a-glucosidase inhibitory activity of hexane extract of *Annona squamose Linn*. In streptazotocin(STZ) induced diabetic rats. RANJANA (T), YAMINI (B), (Department of Medicinal Chemistry, Institute of Medical Sciences, Banaras Hindu University, Varanasi-221 005, Uttar Pradesh State, India). (Indian J. Exp. Biol.; 52, 6; 2014, Jun.; 623-9).

The hexane extract of Annona squamosal(ASHE) in 100 and 400 mg/kg body weight dose raised the insulin level when compared with Glimepiride(1 mg/kg) and also inhibited -glucosidase activity when compared with Acarbose(10 mg/kg) in streptozotocin induced diabetic rats. The ASHE significantly reduced peak blood glucose(G_{p30}) and area under curve(AUC) in diabetic rats in oral glucose tolerance test(OGTT) and oral sucrose tolerance test(OSTT), but there was more reduction of G_{p30} value than AUC in OSTT. Thus, it can be suggested that the ASHE, has hypoglycemic role at 2 levels, i.e. it acts as secretagogue and also inhibits the intestinal enzymes, responsible for glucose metabolism. (30 Ref.; 5 Tab.; 1 Fig.).

49.14946

Abnormal lipid metabolism in collagen-induced arthritis rat model : In vitro, high resolution NMR spectroscopy based analysis. SRIVASTAVA (NK), SHARMA (S), PURUSOTTAM (RN), SINHA (N), SINGH (R), SHARMA (D), (Neurobiology Laboratory, School of Life Sciences, Jawaharlal Nehru University, New Mehrauli Road, Near Muirka, New Delhi-110 067, India). (Indian J. Exp. Biol.; 52, 7; 2014, Jul.; 673-82).

Collagen-induced arthritis (CIA) was induced in female Wistar rats by intradermal injection of porcine immunization grade native collagen type **II** (Chondrex). Monitored the development and progression of CIA by studying histopathological, radiographical and biochemical features of arthritic manifestations in the knee joints, hind limb and blood plasma. In addition, determined the oxidative stress status of arthritic animals by measuring liquid peroxidation and the antioxidant enzyme like catalase, superoxide dismutase and glutathione peroxidase. Employed the high resolution proton nuclear magnetic resonance spectroscopy(NMRS) for the analysis of lipid components in the lipid extracts of the joint tissue and plasma of collagen-induced arthritic and control rats. Triglyceride levels showed significant decreases in plasma (1.7 times) but were exchanged in the joint tissues of CIA rats as compared to control. One-dimensional proton NMR spectra showed a 6.2 times

reduction in the quantity of choline-containing phospholipids in the plasma of CIA as compared to control rats. There was a 1.6 times elevation of choline-containing phospholipids in the joint tissue of CIA rats as compared to controls. Induction of arthritis showed a 4.0 times reduction in the levels of total cholesterol in the plasma and 1.6 times elevation in the joint tissue of CIA rats as compared to controls. The ratio of saturated fatty acids to unsaturated fatty acids was 1.5 times significantly higher in plasma of CIA rats as compared to controls. The results demonstrated significantly altered lipid patterns in the joint tissue and plasma of collagen-induced arthritis rats as detected by one-and two-dimensional NMR spectroscopy compared with controls. (51 Ref.; 1 Tab.; 17 Fig.).

49.14947

Antibacterial activity of Archatina CRP and its mechanism of action. MUKHERJEE (S), BARMAN (S), SARKAR (S), MANDAL (NC), BHATTACHARYA (S), (Environmental Toxicology Laboratory, Department of Zoology, Center for Advanced Studies, Visva-Bharati University, Santiniketan-731 235, West Bengal State, India). (Indian J. Exp. Biol.; 52, 7; 2014, Jul.; 692-704).

The physiological role of C-reactive protein(CRP), the classical acute-phase protein, is not well demonstrated, despite many reports on biological effects of CRP in vitro and in model systems in vitro. Suggested the CRP, which protects mice against lethal toxicity of bacterial infections by implementing immunological responses. CRP is a constitutive multifunctional protein in haemolymph and considered responsible for their survival in the environment for millions of years in *Achatina fulica* CRP. Tested the efficacy of Achatina CRP (ACRP) against both *Sahenonella typhimurium* and *Bacillus subtilis* infections in mice where endogenous CRP level is negligible even after inflammatory stimulus. Further, growth curves of the bacteria revealed that ACRP(50 mg/mL) is bacteriostatic against gram negative *schmonellae* and bactericidal against gram positive *bacilli*. ACRP induced energy crisis in bacterial cells, inhibited key carbohydrate melabolic enzymes such as phosphofructokinase inglycolysis, isocitratre hydrogenase in triocarboxylic acid(TCA) cycle, isocitrate lysasse in glycoxylate cycle and fructose-1,6-biphosphate in gluconeogenesis. ACRP disturbed the homeostasis of cellular redox potential as well as reduced glutathione status, which is accompanied by an enhanced rate of lipid peroxidation. Annexin(A-Cy3/Center for Development Alternatives) dual staining clearly showed ACRP induced apoptosis-like death in bacterial cell ;population. Moreover, immunoblot analyses also indicated apoptosis-like death in ACRP treated bacterial cells, where activation of poly (ADP-ribose) polymerase-1(PARP) and caspase-3 was noteworthy. It is concluded that metabolic impairment by ACRP in bacterial cells is primarily due to generation of reactive oxygen species and ACRP induced anti-bacterial effect is mediated by metabolic impairment leading to apoptosis-like death in bacterial cells. (53 Ref.; 2 Tab.; 19 Fig.).

49.14948

Influence of environmental hypertonicity on the induction of ureogenesis and amino acid metabolism in air-breathing walking catfish (*Clarias batrachus*, Bloch). BANERJEE (B), BHUYAN

(G), SAHA (N), (Biochemical Adaptation Laboratory, Department of Zoology, North-Eastern Hill University, Shillong 793 022, India). (Indian J. Exp. Biol.; 52, 7; 2014, Jul.; 728-38).

Studied the effect of environmental hypertonicity, due to exposure to 300 mM mannitol solution for 7 days, on the induction of ureogenesis and also an amino acid metabolism in the air-breathing walking catfish, *Clarias batrachus*, known to have the capacity to face the problem of osmolarity stress in addition to other environmental stress in its natural habitats. Exposure to hypertonic mannitol solution lead to reduction of ammonia excretion rate by about 2-fold. This was accompanied by significant increase in the levels of both ammonia and urea in different tissues and also in plasma. Further, the environmental hypertonicity also led to significant accumulation of different non-essential free amino acids(FAAs) and to some extent the essential FAAs, there by causing a total increase of non-essential FAA pool by 1.5-2.0-fold in most of the tissues studied including the plasma. The activities of three ornithine-urea cycle(OUC) enzymes such as carbonyl phosphate synthetase, arginine succinate, synthetase and argininosuccinate lyase in liver and kidney tissues and four key amino acid metabolism-related enzymes such as glutamine synthetase, glutamate dehydrogenase (reductive animation), alanine minotransaminase and asparate aminotransminase were also significantly up-regulated in different tissues of the fish while exposing to hypertonic environment. Thus, more accumulation and excretion of urea-N observed during hypertonic exposure were probably associated with the induction of ureogenesis through the induced OUC and the increase of amino acid pool was probably mainly associated with the up-regulation of amino acid synthesizing machineries in this catfish in hypertonic environment. These might have helped the walking catfish in defending the osmotic stress and to acclimatize better under hypertonic environment, which is very much uncommon among fresh water telecasts. (53 Ref.; 1 Tab.; 9 Fig.).

49.14949

43 kDa and 66 kDa, two blood stage antigens induce immune response in *Plasmodium berghei* malaria. PIRTA C), BANYAL (HS), (Laboratory of Parasitology and Immunology, Department of Biosciences, Himachal Pradesh State University, Shimla-171 005, Himachal Pradesh State, India). (Indian J. Exp. Biol.; 52, 8; 2014, Aug.; 781-6).

The hunt for an effective vaccine against malaria still continues. Explored several new target antigens as candidates for vaccine design and tested for their efficacy. The sera from mice immunized with 24000 x g fraction of *Plasmodium berghei* has been used to identify highly immunogenic blood stage antigens. The protective antigens present in immune sera were covalently immunized on (CNBr) activated sepharose 4B and used for affinity chromatography purification of antigens present in blood stages of *Plasmodium beghei*. Two polypeptides of 66 and 43 kDa molecular weights proved to be highly immunogenic. They exhibited a strong humoral immune response in mice as evident by high titres in enzyme linked immunosorbent assay(ELISA) and indirect fluorescent antibody(IFA) test. Protective immunity by these antigens was apparent by in vivo and in vitro studies. These two proteins could further be analysed and used as antigens in malaria vaccine design. (23 Ref.; 2 Tab.; 10 Fig.).

49.14950

Advances in understanding of enzymatic unhairing of bovine hides. DE SOUSA (MF), (M/s. Buckman Laboratories Ltada, Rod. Anhanguera, KM 107.5, Sumaré, Sao Paulo, Brasil). (J. Am. Leather Chem. Assoc.; 109, 8; 2014, Aug.; 268-76).

The unhairing process is the most significant contributor to pollution load in the beamhouse. This has made unhairing as one of most investigated areas over the past few decades, where the focus has been to reduce the amount of sulphur-based chemistry used during processing. In a country like Brazil, with 36 million hides processed every year, the amount of sodium sulphide applied during unhairing is around 10.800 tons/year, which represents approximately 2.200* ton of sulphur added to the process. A conventional unhairing process for bovine hides normally uses sulphide, sulfhydrate, lime, surfactants and one or more auxiliaries based on mercaptans, thioglycolate, amines, urea, enzymes or combination of these. Introduced the use of such auxiliaries many years ago with the purpose of reducing the amount of sulphide/sulfhydrate applied, while improving the efficiency of hair removal and helping to control swelling. Since then, many types of unhairing auxiliaries have come to the market, with different efficiencies. Nevertheless, when the amount of sulphide/sulfhydrate needs to be reduced to very low levels without diminishing the quality of the unhairing and at reasonable cost, enzymatic auxiliaries are the preferred and logical choices. Presented the results, from an enzymatic unhairing process developed by Buckman that allowed the reduction of Na_2S offer to half of the normal levels. In addition to reducing the environmental impact of unhairing-and the whole beamhouse operation-the process also produced significant benefits in terms of increased area yield(from raw hide to wetblue), improved fastness and less drawing while maintaining the same characteristic of grain integrity and tightness. (8 Ref.; 6 Tab.; 7 Fig.).

LEATHER CHEMICALS AND AUXILIARIES

49.14951

Mix to validate : A facile, reversible PEGylation for fast screening of potential therapeutic proteins in Vivo. KIM (TH), SWIERCZEWSKA (M), OH (Y), KIM (A), JO (DG), PARK (JH), BYUN (Y), SADEGH-NASSERI (S), POMPER (MG), LEE (KC), LEE (S), (College of Pharmacy, Sungkyunkwan University, 300 Chonchon-dong, Jang-gu, Suwon 440-746, Korea). (Angew. Chem.; 52, 27; 2013, Jul., 1; 6880-4).

Describes the PEGylation (Poly Ethylene Glycolylation) of proteins through complementary interactions between a His-tag and Ni^{2+}(Nickel) complex of nitrilotriacetic acid(NTA), a well-established practice in protein research and was used to improve the high-life of therapeutic proteins in the blood following systemic administration in vivo. Animal models show that this site-specific modification improves the efficacy of modified TRAIL(Tumor Necrosis Factor-Related Apoptosis-Inducing Ligand) proteins. (27 Ref.; 1 Tab.; 9 Fig.).

49.14952

Controlled release of encapsulated cargo from a DNA icosahedron using a chemical trigger. BANERJEE (A), BHATIA (D), SAMINATHAN (A), CHAKBARTY (S), KAR (S), KRISHNAN (Y), (Department of Biochemistry and Biophysics, National Center for Biological Sciences, UAS-GKVK(University of Agricultural Sciences-Gandhi Krishi Vigyana Kendra), Bellary Road, Jakkur, Bengaluru-560 065, Karnataka State, India). (Angew. Chem.; 52, 27; 2013, Jul., 1; 6854-7).

Describes a deoxyribonucleoro acid(DNA) icosahedron that was held together with aptamers and was used to encapsulate molecular carbo such as fluorescent dextran(green). The optamers fold back leading to opening of the icosahedron and simultaneous release of the encapsulated cargo in the presence of a molecular trigger(grey hexagons). (21 Ref.; 7 Fig.).

49.14953

Reactions template by nucleic acid : More ways to translate oligonucleotide-based into emerging function. GORSKA (K), WINSSINGER (N), (Institut de Science et Ingenierie Supramoléculaires(ISIS-UMR 7006), Universite de Strasbourg-Central National de la Recherche Scientifique(CNRS), 8 allee Gaspard Monge, 67000 Strasbourg, France). (Angew. Chem.; 52, 27; 2013, Jul., 1; 6820-43).

Discusses the programmability of oligonucleotide recognition offers an attractive platform to direct the assembly of reactive partners that can engage in chemical reactions. Recently, significant progress has been made in both the breadth of chemical transformations and in the functional output of the reaction. Summarizes these recent progresses and illustrates their applications to translate oligonucleotide instructions into functional materials and novel architectures like conductive polymers, nanopatterns, novel oligonucleotide junctions; into fluorescent or bioactive molecule using cellular ribonucleoroacid (RNA); to interrogate secondary structures or oligonucleic acids; or a synthetic oligomer. (8 Ref.; 18 Fig.).

49.14954

Rolling circle amplification in a prokaryotic translation system using small circular RNA. ABE (N), HIROSHIMA (M), MARUYAMA (H), NAKASHIMA (Y), NAKANO (Y), MATSUDA (A), SAKO (Y), ITO (Y), ABE (H), (Nano Medical Engineering Laboratory, RIKEN Advanced Science Institute, 2-1 Hirosawa, Wako-Shi, Saitama 351-0198, Japan). (Angew. Chem.; 52, 27; 2013, Jul., 1; 7004-8).

Describes the synthesis of small circular ribonucleoro acid(RNA) molecules containing an infinite open reading frame and their test in an *Escherichia coli* cell-free translation system. A circular RNA 126 nucleotides in length was found to produce more product than its linear counterpart by two orders of magnitude, because a ribosome can work more effectively towards the elongation on circular RNA than it can on linear RNA in this continuous peptide synthesis. (20 Ref.; 15 Fig.).

49.14955

Thermo-responsive hydrogel layers imprinted with RGDS peptide : A system for harvesting cell sheets. PAN (G), GUO (Q), MA (Y), YANG (H), LI (B), (Department of Orthopaedics, The First Affiliated Hospital of Soochow University, 188 Shizi Street, Suzhow, Jiangsu 215006, China). (Angew. Chem.; 52, 27; 2013, Jul., 1; 6907-11).

Describes the efficient promotion of cell adhesion on a polymer surface and detachment of sheets cells, which is possible with thermo-responsive cell culture substrates that are bifunctionalized through noncovalent molecular imprinting. The key is the thermo-responsive "specific binding" of the cell-adhesive peptide RGDS (Rapid Gravity Dewatering System) on the cell sheet harvest system. (49 Ref.; 9 Fig.; 1 Scheme).

49.14956

An air-stable oxyallyl radical atom. MARTIN (D), MOORE (CE), RHEINGOLD (AL), BERTRAND (G), (UCSD-CNRS Research Laboratory(UMI 3555), Department of Chemistry and Biochemistry, University of California San Diego, La Jolla, California 92093-0343, USA). (Angew. Chem.; 52, 27; 2013, Jul., ; 7014-7).

Describes the oxyallyl radical cation that has been formed by simply taking two carbenes by adding carbon monoxide, then HCl and opening the flask to air. (76 Ref.; 1 Tab.; 3 Fig.; 2 Schemes).

49.14957

Organocatalysis by neutral multidentate halogen-bond donors. KNIEP (F), JUNGBAUER (SH), ZHANG (Q), WANTER (SB), SCHINDLER (S), SCHNAPPERELLE (I), HERDTWECK (E), HUBER (SM), (Department Chemie, Technische Universität München, Lichtenbergstrasse 4, 85447 Gerching, Germany). (Angew. Chem.; 52, 27; 2013, Jul., 1; 7028-32).

Describes the neutral multidentate halogen-bond donors(halogen-based lewis acids) that catalyse the reaction of 1-chloroisochroman with ketene silyl acetals. The organocatalytic activity is linked to the presence(and number as well as orientation) of iodine substituents. This case constitutes strong evidence for halogen-bond based organocatalysis as hidden acid catalysis can be ruled out with high probability. (67 Ref.; 2 Tab.; 2 Fig.; 4 Schemes).

49.14958

Structure and reaction mechanism of pyrrolysine synthase(PyID). QUITTERER (F), BECK (P), BACHER (A), GROLL (M), (Center for Ingrated Protein Science Munich(CIPM) at the Department Chemie, Lehrstuhl für Biochemie, Technische Universitat Munchen, Lichtenbergstrasse 4, 85747 Garching, Germany). (Angew. Chem.; 52, 27; 2013, Jul., 1; 7033-7).

Describes the final step in the biosynthesis of the 22nd genetically encoded amino acid, pyrrolysine, which is catalysed by PyID(pyrrolysine synthase), a structurally and mechanistically unique dehydrogenase. This catalysed reaction includes an induced fit mechanism achieved by major structural rearrangements of the N-terminal helix upon substrate binding. Different steps of the reaction trajectory are visualized by complex structures of PyID with substrate and product. (27 Ref.; 8 Fig.; 2 Schemes).

49.14959

Formation of C-SCF_3 bonds through direct trifluoromethyl-thiolation. TLILI (A), BILLARD (T), (Institut de Chimie et Biochemie Moleculaires et Supermoleculaires (ICBMS)-UMR(Universal Molecular Research) CNRS (Central National de la Recherche Scientifique), Universite de Lyon, Universite Lyon 1, CNRS, 43 Bd 63622, Lyon, France). (Angew. Chem.; 52, 27; 2013, Jul., 1; 6818-9).
Describes the SCF_3(scandium fluoride) group that has been introduced into organic substrates as a challenging task because of harsh or specific synthetic method. However, recent advances in the formation of C-SCF_3(Trifluoroethylidyne sulphur trifluoride) bonds include the trifluoromethylthiolation with transition metal-free systems in the presence of palladium, nickel or catalysts. (17 Ref.; 5 Schemes).

49.14960

Towards structure determination of self-assembled peptides using dynamic nuclear polarization enhanced solid-state NMR spectroscopy. TAKAHASHI (H), VIVERGE (B), LEE (D), RANNOU (P), De PAEPE (G), (Laboratoire de Chimie Inorganique et Biologiue, UMR-E3 (CEA/ UJF) and Central National de la Recherche Scientifique(CNRS), Institut Nanosciences et Cryogenie(INC), CEA, 38054 Grenoble, France). (Angew. Chem.; 52, 27; 2013, Jul., 1; 6979-82).

Describes the dynamic nuclear polarization(DNP) that enhanced solid-state nuclear magnetic resonance(NMR) spectroscopy that was performed on self-assembled peptide nanotubes. This approach yields significant experimental time savings(about five orders of magnitude) was used to exemplify the feasibility of supramolecular structural studies of organic nanoassemblies at an atomic scale using DNP-enhanced solid-state NMR spectroscopy. (27 Ref.; 1 Tab.; 7 Fig.).

49.14961

Ultrafast solvent-assisted electronic level crossing in 1-Naphthol. MESSINA (F), PREMONT-SCHWARZ (M), BRAEM (O), XIAO (D), BATISTA (VS), NIBBERING (ETJ), CHERGUI (M), (Max Born Institut für Nichtlineare Optik and Kurzzeitspektroskopic, Max Born Strasse 2A, 12489 Berlin, Germany). (Angew. Chem.; 52, 27; 2013, Jul., 1; 6871-5).

Describes the nonadiabetic inversion dynamics of the energetic order of the electronic excited states of the photoacid 1-naphthol that have been revealed by ultrafast spectroscopy on a femtosecond(fs) timescale. The energetic order of the excited states L_a and L_b of 1-naphthol is reversed in 60 fs in polar dimethyl sulfoxide solvent. (49 Ref.; 9 Fig.).

49.14962

Antimicrobial leather : Preparation, Characterization and application. WANG (Z), GU (H), CHEN (W), (Key Laboratory of Leather Chemistry and Engineering of Ministry of Education, Sichuan University, Chengdu 61006, People's Republic of China and National Engineering Laboratory for Clean Technology of Leather Manufacture, Sichuan University, Wangjiang Campus, No. 24, of South Section 1, Yichuan Road, Chengdu 610065, Sichuan Province, People's Republic of China). (J. Soc. Leather Technol. Chem.; 97, 4; 2013, Jul.-Aug.; 154-75).

Investigated the preparation and properties of polyurethane(PU)-micro-encapsulated clove oil(PU-MCO) in order to produce a new kind of functional antimicrobial leather, that has the lasting ability to kill or inhibit microorganisms. Firstly, the microcapsules were prepared by interfacial polymerization using PU as the wall material. Results of optimization experiments show that when the ratio of shell-core, PEG-TDI(Poly Ethylene Glycol-2,4-toluene diisocyanate) and O/W(Oil/Water) phase are 1:3(w/w), 1:3(mol ratio) and 15:85(w/w), respectively the PU-MCO emulsion obtained is very staple and the encapsulation rate of clove oil can reach 94.3%. Laser particle, zeta potential analyser(ZPA), scanning electron microscopy(SEM), fourier transform-infrared(FT-IR), thermography(TG) and gas chromatography-mass spectroscopy(GC-MS) were used to characterize its size, shape, structure, components and stability. Results indicate that the microcapsule particles assume the spherical shape with average size of 0.2-1.0 mm and the main content of clove oil is not significantly affected by the microencapsulation. However, its heat stability has greatly improved and the starting decomposition temperature can be improved to 110°Centigrade or so. Meanwhile, the microcapsulated clove oil shows a good controlled release property. Results of antimicrobial tests revealed that, although the minimum inhibitory concentrations(MCs) of the microcapsule product are higher than that of crude clove oil, it still has sufficient antimicrobial activity against bacteria, yeasts and moulds. Finally, the PU-MCO was applied in retanning goat garment leather. The leather shows good antimicrobial property which persists for a long time at room temperature and is not significantly affected by perspiration or washing because of the firm physical and chemical combination between the PU wall material and leather fibres. Thus successfully provided a feasible method to prepare an antimicrobial leather with a non-toxic nature and long-term effectiveness by using the microcapsulated natural clove oil. (31 Ref.; 4 Tab.; 16 Fig.).

49.14963

Triphenylene-based tris(N-heterocyclic carbine) ligand : Unexpected catalytic benefits. GONELI (S), POYATOS (M), PERIS (E), (Dpto. De Quimica Inorgánica y Orgánica, Universitat Jaume 1, Avda. Sos Baynat, 12071 Castallón, Spain). (Angew. Chem.; 52, 27; 2013, Jul., 1; 7009-13).

Describes a novel triphenylene-based tris (N-heterocyclic carbine) ligand with D_{3h} symmetry and highly-delocalized system that has been prepared and coordinated to palladium and gold. Compared the catalytic activities of the new complexes with those of related benzimidazolylidene and triptycene-based tris(N-heterocyclic carbine) complexes in three reactions. (51 Ref.; 3 Tab.; 3 Fig.; 1 Scheme).

49.14964

Synthesis of enantiopure carbonaceous nanotubes with optical activity. LIU (S), DUAN (Y), FENG (X), YANG (J), CHE (S), (School of Chemistry and Chemical Engineering, State Key Laboratory of Metal Matrix Composites,Shanghai Jiao Tong University, 800 Dongchuan Road, Shanghai 200240, People' Republic of China). (Angew. Chem.; 52, 27; 2013, Jul., 1; 6858-62).

Describes the self-assembled helical polypyrrole nanotubes which were combined in one step top enantiopure chiral carbonaceous nanotubes with a partially graphitized nanostructure. The ordered-helical arrangement of the carbon nanostructure resulted in enantiomeric materials with distinct optical activity. Moreover, their unique structure endowed them with high reversible storage capacity of lithium ions. (49 Ref.; 11 Fig.; 1 Scheme).

49.14965

Photocatalytic reduction of CO_2 on TiO_2 and other semiconductors. HABISREUTINGER (SN), SCHMIDT-MENDE (L), STOLARCZYK (J), (Department für Physik und Center for Nanoscience(CeNS), Ludwig-Maximilians-Universität(LMU), München, Analienstrasse 54, 80799 München, Germany). (Angew. Chem.; 52, 29; 2013, Jul., 15; 7372-408).

Discusses the rising atmospheric levels of carbon dioxide and the depletion of fossil fuel reserves that raise serious concerns about the ensuring effects on the global climate and future energy supply. The utilization of the abundant solar energy to convert CO_2 into fuels such as methane or methanol could address both problems simultaneously as well as provide a convenient means of energy storage. In this minireview, presents the current approaches for the heterogeneous photocatalytic reduction of CO_2 on TiO_2 and other metal oxides such as oxyntride, sulphide and phosphide semiconductors. Focusses the research in this field primarily on the development of novel nonstructured photocatalytic materials and on the investigation of the mechanism of the process, from light adsorption through charge separation and transport to CO_2 reduction pathways. Discusses in detail about the measures used to quantify the efficiency of the process. (340 Ref.; 2 Tab.; 5 Fig.; 13 Schemes).

49.14966

Optimized synthesis of Fe/N/C cathode catalysts for PEM fuel cells : A matter of iron-ligand coordination strength. TIAN (J), MOROZAN (A), SOUGRATI (MT), LEFÉVRE (M), CHENITZ (R), DODELET (J), JONES (D), JAOUEN (F), (Institut National de la Recherche Scientifique Energiè(INRSE), Materiaux et Telecommunications, 1650 boulevard Lionel Boulet, Varennes(Qc) J3X1S2, Canada). (Angew. Chem.; 52, 27; 2013, Jul., 1; 6867-70).

Describes the highly active Fe/N/C(Iron/Nitrogen/Carbon) catalysts for the oxygen-reduction in polymer-electrolyte-membrane(PEM) fuel cells that can be obtained from a precursor constructed from the zeolitic imidazolate framework(ZIF)-8 and an iron-ligand complex if and only if, the displacement of Zn^{II} ions from ZIF-8 by Fe^{II} ions is restricted. (27 Ref.; 8 Fig.).

49.14967

Development and molecular characterization of interspecific hybrid of *Hibiscus-cannabinus* and *H.radiatus.* SATYA (P), KARAN (M), KAR (CS), MITRA (J), SARKAR (D), KARMAKAR (PG), SINHA (MK), MAHAPATRA (BS), (Crop Improvement Division, Central Research Institute for Jute and Allied Fibres(CRIJAF), Barrackpore Barasat Road, Near Sahab Baga A Bus Stop, Barrackpore, Kolkata-700 120, India). (Indian J. Biotechnol.; 12, 3; 2013, Jul.; 343-9).

Attempted the interspecific hybridization between knaf (*Hibiscus cannabinus*) which finds applications in large numbers of fields including the paper pulp production and high quality biofuel and its wild relative research rose mallow *Hibiscus radiatus* to aid gene flow from wild to cultivated kenaf. Efficiency of hybridization was higher using *H.cannabinus* as female parent. The hybrid exhibited morphological features intermediate of two parents with erect plant type. Expressed the red flower colour of *H.radiatus* in the hybrid, although with reduced intensity. Molecular identify of the hybrid was confirmed using ISSR(Inter Simple Sequence Repeats) and SSR(Simple Sequence Repeats) markers, which produced clear, reproducible bands. The polymorphism was 72% for ISSR marker and 83% for SSR marker. Studied the genetic association of the hybrid, parents and related tetraploid species *H.acetosella* using cluster analysis and principal component analysis. Both studies revealed closer association of the hybrid with tetraploid *H.acetosella.* The ISSR and SSR markers exhibited high amplification, polymorphism and resolving power. (19 Ref.; 5 Tab.; 8 Fig.).

49.14968

A tetrapositive metal ion in the gas phase : Thorium(**IV**) coordinated by neutral tridentate ligands. GONG (Y), HU (H), TIAN (G), RAO (L), LI (J), GIBSON (JK), (Department of Chemistry & Laboratory of Organic Optoelectronics and Molecular Engineering of the Ministry of Education, Tsinghua University, Fourth Floor, Wennan Building, Haidian District, Beijing 10084 China). (Angew. Chem.; 52, 27; 2013, Jul., 1; 6885-8).

Describes a Th^{4+} ion supported by three neutral tetramethyl-3-oxyglutaramide ligands (L=TMOGA) produced in the gas phase by electroscopy ionization. The thorium in Chiral $Th(L)_3^{4+}$ is coordinated by nine oxygen atoms. Quantum chemical studies revealed a decrease in Th-O binding energies and bond orders and an increase in bond lengths, as the number of coordinating ligands increases. (45 Ref.; 1 Tab.; 3 Fig.).

49.14969

Continuous gas-phase hydroaminomethylation using supported ionic liquid phase catalysts. SCHNEIDER (MJ), LIJEWSKI (M), WELFER (R), HAUMANN (M), WASSERSCHEID (P), (Department

of Chemical and Bioengineering, Freidrich-Alexander-Universitat Erlengen-umberg, Egerlandstrasse 3, 41058 Erlangen, Germany). (Angew. Chem.; 52, 27; 2013, Jul., 1; 6996-9).

Demonstrates the hydroaminomethylation of ethylene and diethylamine to diethylpropylamine as a continuous gas-phase reaction using a supported ionic liquid phase(SILP) to immobilize the applied homogenous Rh-Xantphos catalyst. Obtains the highly selective and long-term stable(18 days) catalyst operation if the ionic liquid was of low basicity and lipophilicity combined with a process activated carbon support. (21 Ref.; 2 Tab.; 3 Fig.; 2 Schemes).

49.14970

Alkylation of phenol with cyclooctone : Effect of temperature, molar ratio of reactants and amount of catalyst. ALAM (MdZ), SAHA (M), (Department of Applied Chemistry & Chemical Engineering, University of Dhaka, Nilkhat Road, Dhaka 1000, Bangladesh). (J. Sci. Ind. Res.; 72, 7; 2013, Jul.; 411-4).

Reported the alkylation of phenol with cyclooctene in presence of benzenesulphonic acid as catalyst under different reaction conditions which yields in industrially important 2- and 4-cyclooctylphenols. Studied the effects of some reaction parameters such as temperature, molar ratio of phenol to cyclooctene and amount of catalyst to find out the optimum reaction conditions. The yields of cyclooctylphenols were found to be increased with an increase in temperature, molar ratio of phenol to cyclooctene and amount of catalyst. The alkylated products were characterized by different spectroscopic means. (15 Ref.; 3 Tab.; 1 Scheme).

49.14971

Part load performance analysis of vapour compression refrigeration system with hydrocarbon refrigerants. THANGAVEL (P), SOMASUNDARAM (P), (Department of Mechanical Engineering, Kongo Engineering College, Thoppupalayam, Perundurai-638 052, Tamil Nadu State, India). (J. Sci. Ind. Res.; 72, 7; 2013, Jul.; 454-60).

Aims for a study, on the effect of evaporation load on performance of vapour compression refrigeration system with hydrocarbon refrigerants at different loads in evaporator. Hydrocarbon mixture (HCM) is an alternative refrigerant for hydrofluorocarbon (HFC) and chlorofluorocarbon(CFC) compounds due to their global warming potential(GWP) and zero ozone depletion potential(ZODP). The impact on the environment is also reduced due usage of hydrocarbons as refrigerants. Computationally analysed 50% of Propane(R290) and 50% of Isobutane(R600a) by mass fraction is used as a refrigerant in this analysis. Analysed computationally about the effects of condenser and evaporator temperature. Investigated the various performance parameters like compressor input power, discharge temperature, heat rejected in the condenser, refrigeration effect and coefficient of performance at various loads of 25%, 50%, 75% and 100% in the evaporator. As compared to other loads, 75% load in the evaporator is economic made to operate the system due to 3.81% reduction in compressor input

power, 4.76% reduction in discharge temperature, better condenser heat rejection rate and refrigeration effect. (15 Ref.; 1 Tab.; 9 Fig.).

49.14972

Silicon**(II)** chemistry : N-heterocyclic carbine complexes of Si^{2+} and SiI^{+}. FILIPPOU (AC), LEBEDEV (YN), CHERNOV (O), STRASSMAN (M), SCHNAKENBURG (G), (Institut für Anorganische Chemie, Universität Bonn, Gerhard-Domagk-Strasse 1, 53121 Bonn, Germany). (Angew. Chem.; 52, 27; 2013, Jul., 1; 6974-8).

Describes the exchange of N-heterocyclic carbine(NHC) ligands at Si^{II} centers that has been shown to provide access to a dicationic NHC complex of silicon(**II**) and a NHC adduct of the iodosilyliumylidene cation SiI^{+}, $[SiI(liPr_2Me_2)(IDipp)]^{+}$. Characterization studies led to the discovery of an unprecedented C—H...Si anagostic interaction for $[SiI(l/\cdot Pr_2Me_2(LDipp)]^{+}$. (66 Ref.; 4 Fig.; 2 Schemes).

FINISHING MATERIALS

49.14973

Sulfitation of animal bone fat for use as a fatliquor. OLA (AM), HABIB (MA), El SAYED (NH), (Chemistry of Tanning, Material and Leather Technology Department, Chemical Industries Division, National Research Center, No. : 33 El Duhouth Street, Dokki, Cairo Govemorate, Cairo, Egypt). (J. Soc. Leather Technol. Chem.; 98, 5; 2014, Sep.-Oct.; 205-10).

Describes the animal bone fat, that had been chemically treated with sodium sulphite via epoxidation in presence of an heterogeneous catalyst namely Dowex 550 sw2-200. This approach was to avoid fatty matter degradation when using direct oxidation. Produced a high stability fatliquoring agent. The fatliquor enhanced the mechanical properties of leather, including tensile strength, elongation at break % and also exhibited better appearance. (12 Ref.; 9 Tab.; 5 Fig.).

49.14974

Characterizing particles in nano-powder regimes. OJHA (T), DOSRAMOS (JG), (M/s. Matec Applied Sciences, No. : 56 Hudson Street, Northborough, Massachusetts, USA). (Chem. Wkly.; 60, 15; 2014, Nov., 18; 199-201).

The particle size and particle size distribution(PSD) of the nanoparticles are of great importance to the end user because they affect key colloid properties such as rheology, film gloss, surface area and packing density. Additionally, it is very firmly stressed about the steps that should have to be taken for preventing both the aggregation of fine particles into much larger, undesirable units and also the particles from sticking

together(aggregating) due to interparticle collisions in the liquid medium. This can be accomplished by creating an interparticle electrical and/or steric energy barrier. (3 Fig.).

LEATHER PROPERTIES. QUALITY CONTROL

49.14975

Preparation and application of an amphiphilic acrylic copolymer as a retanning agent. JIN (L), WEI (Y), WANG (Y), LI (Y), (School of Leather Chemistry and Engineering, Qilu University of Technology, Jinan 250353, Shandong Province, People's Republic of China). (J. Soc. Leather Technol. Chem.; 99, 5; 2014, Sep.-Oct.; 222-8).

Describes the synthesis of an amphiphilic acrylic copolymer of lauryl acrylate and acrylic acid for use as a retanning agent for chrome-tanned leather. Measured the structure of the resulting product which is characterized by Fourier infrared spectroscopy(FT-IRS) and particle size with a dynamic light scattering(DLS) instrument. Investigated the correlation between thermo-monomers ratio of the prepared copolymer and its application properties by measuring such physical/mechanical indexes of the retanned leather as thickness instrument ratio, tensile strength, elongation at break and tear strength. Explored the retanning mechanism of the polymeric syntan by scanning electron microscopy(SEM), X-ray diffraction(XRD) and dynamic mechanical analysis(DMA). The performance of the product is found to be strongly affected by the composition of the amphiphilic polymer. The leather retanned by the amphiphilic polymeric syntan achieves an improvement of mechanical properties, as well as enhancement of thermal stability. The results of instrumental analysis also provide evidence to the applicability of the prepared copolymer as an efficient retanning agent for chrome-tanned leather. (16 Ref.; 2 Tab.; 15 Fig.).

49.14976

Influence of elastin degradation on the leather mechanical properties of leather. SCHRÖPFER (M), KLÜVER (E), MEYER (M), (FILK Research Institute for Leather and Plastic Sheeting Meissner Ring 1-5, D-09559 Freiberg, Germany). (J. Am. Leather Chem. Assoc.; 109, 9; 2014, Sep.; 306-13).

Investigated the influence of elastin degradation in leather on important mechanical properties. Determined the elastic content of pelts and wet blues by chromatographic analysis of desmosine, which is a specific and hydrolytically stable crosslinking. Analysis of pelts was performed directly, while chrome containing samples had to be detanned prior to analysis. Demonstrated the elastase, that significantly reduces the elastin content. In contrast to often assured statements on the marked influence of elastase on softness, area yield, tensile strength and elongation of leather, the investigations, that have been earlier performed by the above authors, have shown no significant changes in the mechanical properties of leather as well as area yield, grain quality or softness area treatment with elastase. It is concluded that the impact of elastin on leather properties is generally lower than postulated before or that it is not pronounced in the dry state. (12 Ref.; 3 Tab.; 12 Fig.).

49.14977

Micro-computed tomography studies for three-dimensional leather structure analysis. BITTRICH (E), SCHLADITZ (K), MEYNDT (R), SCHULZ (H), GODEHARDT (M), (FILK Research Institute for Leather and Plastic Sheeting, Meissner Ring 1-5, 09599 Freiberg, Germany). (J. Am. Leather Chem. Assoc.; 109, 11; 2014, Nov.; 367-71).
Describes the use of micro-computed tomography for the elucidation of three-dimensional microstructure leather. Layers of leather, fiber bundles with their branches and inner structure are detectable. Stressed the need of the technique with high resolution such as scanning electron microscopy(SEM) for the fine-fibered and dense-structured grain layer. Discussed the problems encountered in image analysis with respect to automated segmentation and presented alrernative solutions. (11 Ref.; 17 Fig.).

BY-PRODUCTS

49.14978

Pyrolysis of chromed leather waste shavings in fluidized bed. SIMIONI (T), MATOS (E), BACCA (VM), PERONDI (D), GODINHO (M), DETTMER (A), (Graduate Program in Engineering and Process Technology Energy and Bioprocess Laboratory(LEBio), Rua Francisco Getulio Vergas, 1130, CEP.95.070-560, Caxias DO Sul-RS, Brazil). (J. Am. Leather Chem. Assoc.; 109, 10; 2014, Oct.; 342-52).

The leather industry generates a large amount of solid waste, which sometimes has pollution potential. Chromium is often present in this waste. Thermal treatment proves to be a promising method for the reuse of leather waste. The pyrolysis process involves heating the biomass in an inert atmosphere. The products are gas, oil and carbonaceous solid residue(char). Aims, mainly for an investigation, of the production of useful materials from chromed leather waste shavings(CLWS) pyrolysis. This waste was characterized by chromium, total Kjeldahl nitrogen and ashes content. Determined the volatile content, higher calorific value, thermo gravimetric analysis(TGA) and scanning electron microscopy(SEM). A fluidized bed reactor was used for the tests. The parameter varied in the experiments was the temperature(723K and 873K) and heating rates(0,25 and 0,4 K/s). Evaluated the product fractions yield and was found that the pyrolysis temperature of 873K has a high yield of oil. The oil was characterized using the technique of Fourier transform infrared spectrophotometry (FTIR) and gas chromatography (GS) with mass spectrometry(MS), that showed the presence of oxygenated organic compounds like alcohols, phenols, ketones and even non-oxygenated organic compounds like alkanes, alkenes, aromatics in its composition. The char was characterized according to the techniques of SEM and energy dispersive spectroscopy(EDS). According to the results of these analyses, the char has a porous morphology and is basically composed of C(Carbon), Cr(Chromium), Na(Sodium), Mg(Magnesium) and Cl(Cobalt). Thus, the pyrolysis of CLWS appears as a promising alternative for the treatment of these residues and to obtain useful products. (37 Ref.; 7 Tab.; 12 Fig.).

49.14979

Collagen and keratin colloid systems with a multifunctional effect for cosmetic and technical applications. MATYASOVSKY (J), SEDLIACIK (J), MATYASOVSKY, Jr. (J), JURKOVIC (P), DUCHOVIC (P), (Technical University, Masryka 24, 960 53 Zvolen, Slovakia). (J. Am. Leather Chem. Assoc.; 109, 9; 2014, Sep.; 284-95).

Collagen and keratin are renewable materials and their sources are almost unlimited. Therefore, an effort, has been made to constantly improve existing products and find new options for their application and processing. Aims for an investigation, of the development of additives with high added value on the basis of modified collagen and keratin for the field of cosmetics. Analysed earlier for many possibilities of effective and ecologic processing and application of leather wastes tanned and untanned to different products. (26 Ref.; 7 Tab.; 8 Fig.).

49.14980

Leather fatliquoring from hide fleshings. HABIB (MA), ALSHAMMARI (AG), (Chemistry of Tanning Materials and Leather Technology Department, Chemical Industries Division, National Research Center, No. : 33 El Duhouth Street, Dokki, Cairo Govemorate, Cairo, Egypt). (J. Soc. Leather Technol. Chem.; 98, 5; 2014, Sep.-Oct.; 199-204).

Discusses that the huge amount of fleshings from tanneries around the world creates a negative environmental input, in addition to disposal costs but the wastes are not well used. Presents some innovative processes, for reclaiming the fats carried by a large variety of flesh hides or skin wastes, along with the fatty matter separation and modification to obtain a surface active material intended to be used as leather softening agents. Extracted the fat with hot water at a fixed temperature(85±5°Centigrade, solid : water 1:1 w/v and 2 hours stirring time). The fat rich phase was then separated and purified with n-hexane(fats : n-hexane 1:8 w/v ambient temperature and one hour stirring time). The fat was cooled to 12°Centigrade and filtered under pressure to isolate the unsaturated oleic fraction and exclude the stearic fraction. The chemical evaluation of oleic fraction indicated that it was suitable for the production of leather softening(fatliquoring) agent. The product was treated with sodium bisulfide(1.5 mol/kg based on weight of fat, 85°Centigrade, 2 hours stirring and continuous air flow). A good quality fatliquoring agent was produced. Applications of the fatliquor emulsion on wet-blue leather showed enhanced mechanical properties, tensile strength, elongation and improved appearance. Thereby the waste was transformed into a valuable resource. (37 Ref.; 5 Tab.; 8 Fig.).

49.14981

A cleaner Al_2O_3-ZrO_2/MMT nanocomposite adsorbent based on Al-Zr tanning waste. TAO (E), HONG-RUI (M), YUN (L), (College of Resource and Environment, Shaanxi University of Science and Technology, University Zone of Wei Yang District, Xi'an 710021, Shaanxi Province,

People's Republic of China and Leather Institute of Haining City, Jiaxing 314400, People's Republic of China). (J. Am. Leather Chem. Assoc.; 109, 11; 2014, Nov.; 389-96).

Discusses that a nanocomposite adsorbent of Al_2O_3-ZnO_2/MMT(AIMMT) (aluminium/zirconium montmorillonite) nanocomposite absorbents was produced by intercalating Al_2O_3-ZrO_2 into interlayers of MMT which was from the waste of Al-Zr tanning agent used when making leather. The AIMMT nanocomposite was characterized by X-ray Diffraction(XRD), Transmission Electron Microscopy(TEM) and Scanning Electron Microscopy(SEM). Analysed the factors that affected the adsorption process of Cr^{3+}(Chromium(**III**) oxide). Cr^{3+} was adsorbed on the surface of AIMMT. The adsorbing processes were mainly surface adsorption, ion exchange and electrostatic forces. Cr^{3+} adsorption kinetics and isotherm of AIMMT can be described by pseudo-second-order kinetics and Langmuir equation at 25°Centigrade. (22 Ref.; 2 Tab.; 15 Fig.).

49.14982

Vascular grafts : An overview. MANJUNATH (RN), KARTHIK (D), (DKTE's Textile and Engineering Institute, Rajwada, P.O. Box No. :130, Ichalakaranji-416 115, Kolhapur District, Maharashtra State, India). (Colourage; 61, 10; 2014, Oct.; 82-6).

Vascular diseases are becoming more and more important in general and clinical practices due to a steadily growing number of patients and considerable diagnostics and therapeutic advances. The design and fabrication of synthetic vascular prostheses have been challenging to the area of surgical research over the last four decades. Vascular grafting is the use of transplanted or prosthetic blood vessels in surgical procedures. Textile structures are usually the materials used for arterial replacement as vascular grafts must have specific characteristics. However, they do not always meet all the requirements. The most important aspects of an arterial graft are porosity, compliance and bio-degradability. A graft should be micro porous to provide a stable anchorage for vascular cells and stimulate cell in growth. Most textile grafts are constructed either of polyethylene terephthalate (PET) whose commercial name is Dacron or polythetrafluoroethyle (PTEF) which is known as Teflon. (9 Ref.; 8 Fig.).

49.14983

Carbon footprint and energy balance of biodiesel produced from tannery fleshings. KILIC (E), PUIG (R), BAQUERO (G), ZENGIN (G), (Igualada School of Engineering(EEI), Universitat Politecnica de Catalunya(UPC), Campus Extern-Edif. EEI Avinguda Pla de la Massa 8, 08700 Igualada, Barcelona, Spain). (J. Am. Leather Chem. Assoc.; 109, 9; 2014, Sep.; 296-305).

Analysed the environmental performance of biodiesel obtained from leather industry fleshing waste(biodiesel production from fleshing process(BDF)) from a life cycle perspective. The indicators used from this environmental evaluation are (a) global warming potential(GWP) and (b) energy return on investment(EROI). Determined the contribution of each process-

step in both GWP and EROI. Proved the tranesterification of fat to obtain the BDF as the most significant step in the process, due to the consumption of methanol. A comparison has also been performed between BDF and petroleum diesel obtained from non-renewable oil using some indicators. The results show a clear preference for BDF, although data from industrial real plants has to be considered in further works for BDF process to provide more accurate results. (28 Ref.; 3 Tab.; 5 Fig.).

49.14984

Cyclic dechroming process for chrome shavings by coordination substitution reaction and photocatalysis. TANG (Y), HU (Z), LIU (H), HU (W), WANG R), (Institution of Chemical ..... st Section, 1st Ring Road, Wuhou, Sichuan Province, Chengdu 610065, People's Republic of China). (J. Am. Leather Chem. Assoc.; 109, 11; 2014, Nov.; 380-8).

Investigated the cyclic dechroming process for chrome shavings by method of coordination substation reaction and photocatalysis. The process conditions were optimized through the orthogonal tests by using EDTA(ethylene diamine tetraacetic acid) as dechroming agent and NAOH(sodium hydroxide) as recovery agent. The removal efficiency of chrome from chrome shavings was 98.88% when dechroming was undertaken in 0.03 mol/L EDTA solution at 50°Centigrade and *p*H 6.0 for 14 days with stirring and then treated in the same solution under ultraviolet(45 W, 254 nm) for 8 days and the loss of collagen was 5.31%. The chrome was separated from the dechroming solution as $Cr(OH)_3$(Chromium(**III**) hydroxide) precipitate by adding NaOH into the dechroming solution(concentration of NaOH=1.00 mol/L) and stirring at 70°Centigrade for 1 day. The solution containing EDTA was reused for dechroming again after filtering and adjusting *p*H to 6.0 by sulphuric acid and the removal efficiencies of chrome were all more than 97% in triplicate trials. The structure of collagen after chrome extraction was characterized by scanning electron microscopy(SEM) and fourier transform-infrared(FT-IR). The results indicated that the triple helix structure of collagen was well preserved. The thermal stability of collagen after chrome extraction was characterized by dynamic scanning microscopy(DSM); the results indicating that it was inconformity with rawhide. The dechroming process without strong acid and alkali can prevent collagen from hydrolysis. A certain amount of Cr**(VI)** is appeared by adding alkali in precipitating Cr and recovering EDTA. However, Cr**(VI)** was reduced to Cr**(III)** when *p*H of the recovered EDTA solution was adjusted to 6.0 by adding sulphuric acid. This kind of closed recycling dechroming technology can reuse dechroming agent and thus avoid the elution of wastewater during dechroming process. (31 Ref.; 7 Tab.; 5 Fig.).

49.14985

Determination of the reactive dye *N*avy *B*lue *H*er in the wastewaters of the dyeing processes of chrome-tanned leather. SANTOS (LSP), CRISPIM (LF), SILVA (NMC), OLIVEIRA (NS), (Technological Center for Leather Industries, Apartado 158-S.Pedro, 2384-909 Alcanena, Portugal). (J. Am. Leather Chem. Assoc.; 109, 10; 2014, Oct.; 330-41).

Discusses one of the main environmental problems in the leather industry i.e. the contaminant load and amount of effluent produced during the industrial process. Highlighted those, resulting from the dyeing processes from these effluents that contribute to the increase of the chemical oxygen demand(COD) and biological oxygen demand(BOD) of the discharged wastewaters. Aims the development and validation, of the simple, rapid, specific, selective, precise, robust and economical ultraviolet-visible(UV-Vis) spectrophotometric method for the estimation of reactive dye(*N*avy *B*lue *He*r) in aqueous solutions and effluents of the dyeing processes of chrome-tanned leather. UV-Vis spectrophotometric measurement was carried out at a wavelength of maximum absorbance of 610 nm using ultrapure water as the solvent. Validated the developed method with respect to specificity, selectivity, sensitivity, limits of detection and quantification, linearity, precision(respectability, intermediate precision) and robustness. The calibration curve(Abs=0.01054C to 0.00067) is linear(r2=0.99998) in the concentration range from 3.0 mg/L upto 48.0 mg/L. The limit of detection(LOD) and the limit of quantification(LOQ) are 0.206 mg/L and 0.624 mg/L, respectively. The analysis results and its statistical treatment have proved that this analytical method is specific, selective, precise and robust and has good repeatability and intermediate precision. Thus, the proposed method was approved for all the analysed parameters, being therefore, properly validated and can be successfully applied for the estimation of reactive dye(*N*avy *B*lue *He*r) in aqueous solutions and effluents of the dyeing processes of chrome tanned leather. (42 Ref.; 3 Tab.; 4 Fig.).

WOOL TECHNOLOGY

49.14986

Processing of Llama fibres in textile industries. MAHAPATRA (NN), (Business Development Division, M/s. Colorant Limited, No. : 302, Abhiraj, No. : 68-B, Swastik Society, Navarangpura, Ahmedabad-380 009, Gujarat State, India). (Colourage; 61, 10; 2014, Oct.; 76-80).
Discusses in detail about the manufacture, preparation, hand spinning & uses of llama fibres and positive attributes and properties as well as their advantages over wool and synthesis and uses of llama fibres.

49.14987

Comprehensive view on characteristics and applications of smart chromic textiles. SENGUPTA (A), BEHERA (J), (Sportech Laboratory, Wool Research Association, Akbar Camp Road, Thane-400 607, Marathwada District, Maharashtra State, India). (Colourage; 61, 10; 2014, Oct.; 42-52).

Discussed the provisions, of the new "smart" materials to the textile and fibre industries including textile fibres like wool, paper, leather, that can quickly change their colour hue, depth shade, or optical transparency. (50 Ref.; 2 Tab.; 6 Fig.).

49.14988

Study on reutilization of wet-blue leather wastes for the production of regenerated leather composite. QIAN (C), (School of Material and Textile, Jiaxing University, Jiaxing 314001, Zhejiang Province, China). (J. Am. Leather Chem. Assoc.; 109, 11; 2014, Nov.; 372-9).
Investigated the possibility of making use of wet-blue leather wastes on a large scale through a nonwoven method. Firstly, collagen fibres were extracted from the wastes and their structure was characterized. The water absorbency of collagen fibres was tested and compared with that of wool and silk fibres. Then, a composite of regenerated collagen fibres on a lease layer of polyamide fiber/polyester fiber(PA/PET) and visco fiber and tested their physical properties. The results indicated that most of the expected short collagen fibres existed in bundles, their fibres' length were in the range of 25-45 mm and their finesse was in the range of 2.5 mm. The extent of water absorption of collagen fibres was similar to that of wool fiber. The collagen fiber composite on the base layer of PA/PET had good tensile and tearing strength. Moreover, the composite had good moisture permeability with the viscose fibres as a support base layer. (23 Ref.; 2 Tab.; 16 Fig.).

TANNERY. ENVIRONMENTAL ASPECTS

49.14989

Rapid determination of glutaraldehyde in leather by UV spectrophotometry Reverse Flow Injection System. YU (L), WU (M), DONG (W), WEN (Y), ZHOU (C), LIU (S), JIN (J), LIN (W), (College of Polymer Science and Engineering and State Key Laboratory of Polymer Materials Engineering, Sichuan University, No. : 24 South Section 1, Yihuan Road, Chengdu 610065, Sichuan Province, People's Republic of China). (J. Soc. Leather Technol. Chem.; 98, 5; 2014, Sep.-Oct.; 211-5).

Proposes a simple, accurate and sensitive reverse flow injection analysis(rFIA) ultraviolet(UV) method for determination of glutaraldehyde in leathers in order to control pollution by glutaraldehyde. Glutaraldehyde and hydroxylamine hydrochloride undergo a condensation reaction at 40°Centigrade. The absorbance of the complex is measured by a UV detector at 236 nm. Discusses the rFIA variables affecting the system. The linear range of this method was 0.5-200 mg l^{-1}; the detection limit was 0.03 mg l^{-1}; the relative standard deviation was 0.784% under the optimal conditions. This method was suitable for automatic and continuous analysis and successfully applied to determine the content of glutaraldehyde in leathers. (10 Ref.; 2 Tab.; 7 Fig.).

49.14990

Headspace GC-MS for the determination of halogenated hydrocarbons, ethers and aromatic volatiles in fabric and leather. CHORIER (E), BLANC (N), CANNOT (J), BERTHOD (A), (Institut des Sciences Analytiques, Central National Researche Scientifique(CNRS), Université de Lyon, 5 Rue de la Dova, 69100 Villeurbanne, France). (J. Am. Leather Chem. Assoc.; 109, 10; 2014, Oct.; 322-9).

The content of volatile organic compounds was required in industrial products. At present, it is also sought in household products. The detrimental impact of VOCs(Volatile Organic Compounds) on air quality and human health pushed state authorities to take measures to reduce their emissions and occurrence in circulating goods. A set of 28 VOCs including 20 halogenated alkyl and aromatic compounds, two ethers and six hydrocarbons was built as a model of most VOCs possibly encountered in leather and textile commercial products. A variety of leather and textile matrices were spiked with known amount of the VOC mix. It is shown that the headspace(HS) extraction must last for 45 minutes at 90°Centigrade to reach full recovery of the least volatile compounds(1,2-diclorobenzene) even if 80% and more recovery is obtained in 5 minutes at 90°Centigrade for all 28 VOCs contained in 20 mg amounts of leather and textile samples. The single ion-monitoring(SIM) mode of the mass spectrometer was needed to quantitate several VOCs overlapping in the chromatogram. The HS GC-MS(Gas Chromatography-Mass spectrometry) method produced a statistically validated limit of quantification of 2.5 mg/kg(ppm) for all the 28 analysed VOCs. (19 Ref.; 2 Tab.; 2 Fig.).

49.14991

Observational evidence of the southward transport of water masses in the Indian sector of the Southern Ocean. CHACKO (R), MURUKESH (N), GEORGE (JV), ANIL KUMAR (N), (National Center for Antartic and Ocean Research, Headland Sada, Vasco-da-gama, Goa-403 804, India). (Curr. Sci.; 107, 9; 2014, Nov.; 1573-81).

The southward transport of water masses in the Indian sector of the Southern Ocean(SO) is compared using the hydrographic data collected during the austral summer of 2010 and 2011. It has been found that subtropical surface water(STSW) underwent maximum southward displacement during the study period. The southward extent of STSW was at 45°South during 2010. During 2011, three eddities were identified along the cruise track, whereas during 2010 eddies were absent. Satellite sea-level anomaly showed that these eddies were associated with the highly unstable Agulhas Retwin Current(ARC). STSW, that had been transported along the peripheries of these eddies during 2011, is shown. There are indications of transport of mode water as well, but this is not resolved in the present study. Analysis of eddy kinetic energy shows a positive linear decade trend; also, peak eddy lagged the southern annular mode by a year. This indicates that through the eddies may act locally, they are linked to the large scale variability in the southern hemisphere. (39 Ref.; 22 Fig.).

49.14992

Modelling a strategic raw hides & skins supply chain network suitable for adoption of chilling method of preservation in decentralized collection system. ANANTHANARAYANAN (P), PRASAD (PSS), CHANDRAMOULI (D), CHANDRA BABU (NK), (Tannery Division, Council of Scientific and Industrial Research-Central Leather Research Institute(CSIR-CLRI), Adyar, Chennai-600 020, India). (J. Am. Leather Chem. Assoc.; 109, 10; 2014, Oct.; 353-62).

Salt curing is a method that is widely used for the preservation of raw hides and skins worldwide and this leads to high salinity in tannery effluents. The treatment of such highly saline stream poses serious challenges, as pollution control norms for salinity are quite stringent in many countries including India. Chilling has been proven most efficient method both in terms of cost and preservation efficacy for short-term storage but adoption in decentralized raw material collection systems prevailing in many developing and underdeveloped countries is a major challenge. Attempted the modelling of a strategic supply chain network for collection and chilling of raw hides and skins suitable for such decentralized situations in this techno-management study. Tamil Nadu state in India has been chosen for the pilot project as it contributes close to 550% of the tanning activity in India. Eight clusters have been formed by grouping the districts of Tamil Nadu based on the geographical location. The optimized location for the chiller in each cluster was found using gravity location model and studied the feasibility of transporting the raw hides and skins from slaughterhouse to chiller. (25 Ref.; 3 Tab.; 3 Fig.).

49.14993

Efficient remote video monitoring for industrial environment based on LPC 2148 and GSM. BAGHYASREE (T), JANAKIRAMAN (K), PARKAVI (DM), (Embedded System, School of Computing, SASTRA University, Tirumalaisamudhram, Thanjavur-613 401, Tamil Nadu State, India). (Indian J. Sci. Technol.; 7, 9; 2014, Sep.; 1333-41).

Remote video monitoring system is one of the most important occasions for the entire industrial environment for security purpose through wireless networking. Wireless monitoring systems are used in many areas, especially for surveillance, monitoring and controlling the industrial operations. New technologies are arising for the purpose of industrial developing process in addition it needs the security system for maintenance in day to day life. The main purpose of this system is to protect the industries from risky situations. This system proposes a real time video monitoring device to detect the intruders which is based on ARMLPC1248 processor. Even so lots of video monitoring technology was available, but the integral system does not have the ability of perfect communication strategy. Proposes an efficient system for monitoring the industrial environment by using a wireless camera to seize the video. Zigbec(CC2500) is instantly triggering the camera for video capture and Global system for Mobile Communications(GSM) for sending subscribers mail service(SMS) alerts to superior mobile for preventing the hazardous situation when the ultrasonic sensor detecting the occurrence of the intruders or dynamic obstacle. The overall system performance is meliorating by using this technique and provides less power consumption, scalabiity, reliability and cost effective. (22 Ref.; 10 Fig.).

49.14994

Green destiny. (China Leather Industry Association; (Leather Intl; 216, 4844; 2014, Sep.; 28-30, 32&34).

Speaks about the regulation, guidance and the implementation of green measures as the China's leather industry is heading towards a greener future following a challenging period of transformation. (3 Photos).

49.14995

Determination of total chromium in tanned leather samples used in car industry. BAJPAI (D), (M/s. Bureau Veritas Consumer Products Services India Limited, C-19, Sector-07, Noida-201 301, Uttar Pradesh State, India). (Leather News India; 5, 10; 2014, Oct.; 45-50).

Aims for a presentation of an appropriate analytical method for monitoring Cr(**VI**) and the total chromium present on leather materials. Observed, the amounts of total chromium as well as of Cr(**VI**) are higher than prescribed and recommended by different regulations, through the application of this method to chromium-tanned leather samples. Chromium(**VI**) exceeded the limit of 3 mg/kg in the majority of tested materials, while the total chromium exceeded the limit of 50 mg/kg in all tested samples. It is recommended to avoid direct and prolonged contact of those materials with the skin, for this reason. (3 Tab.).

LEATHER PRODUCTS

FOOTWEAR

49.14996

The identity of leather : Committed to calf. THOMAS (C), (M/s. Maison Thomas, Muhammad Mazhar. AZ Zamalek, Egypt). (World Leather; 27, 5; 2014, Oct./Nov.; 48-50).

Indicates that the pain, of recent reductions in the availability and increase in price of calfskins and calf leather but at the same time, its commitment to the material remains unshaken for its high end bags and purses, is very strongly felt. (3 Photos).

49.14997

Striving for imperfection. BELLESE (F), (M/s. JBS Couros, Av. Marginal Reight Tiete, 500 CEP 05118-100 Bao Paolo/SP, Brasil). (Leather Int'l; 216, 4845; 2014, Oct.; 32&34).

Revealed the realm of imperfections in leather articles is delved and mark as a seal of quality as the quality craftsmanship can be perceived through a number of factors, from cost to durability but a doubt is arised about the sheer aesthetics. (2 Photos).

LEATHER GOODS

49.14998

Tanning technique of Sturgeon skin. QIANG (T), BU (Q), REN (L), WANG (X), MENG (X), (Key ~~Laboratory of Auxiliary Chemistry & Technology for Light Chemical Industry, Shaanxi University~~

of Science and Technology, No. : 6 Xuefu Road, Weiyang District, Xi'an, Shaanxi 710021, People's Republic of China). (J. Soc. Leather Technol. Chem.; 99, 5; 2014, Sep.-Oct.; 229-35).

A research was done on the character of the skin's organizational structure by using artificially bred sturgeon skin as the raw material. Various techniques like mechanical strength reduction, oxidation-reduction, oxidation-reduction bleach, multi-procedure degreasing and manual fleshing etc. were adopted during the tanning procedure in order to keep the integrity of its natural and special scale structure and also to enhance the removal of melanin on the grain surface as well as fat inside the skin. Obtained a set of mature and feasible tanning process for storage on skin. The softness and fullness as well as the physical mechanical performance of the finished leather made by the process are good and it would be a good choice for the high-end bags. (14 Ref.; 3 Tab.; 3 Fig.).

49.14999

Microscopic observation of tensile testing on leather fibre bundles. MEYNDT (R), GRAHL (A), SCHULZ (H), (Forschungsinstitut für Leder und Kunstsoffbachmen GmbH(FILK), Meissner Ring 1-5, 09599, Freiberg, Germany). (World Leather; 27, 5; 2014, Oct./Nov.; 17-9).

The simultaneous acquisition of data on tensile force and extension values as well as sequences of microscopic images, enables the process of fibre extension and rupture to be optically traced and documented. Revealed the way of fibres. As an example, it shows if either a cracking or a twisting of the sub-units occurs during the breaking process. Such information subsequently being used to gain insight into ways to possibly improve behaviour and within material modelling. (3 Ref.; 4 Fig.).

49.15000

The identity of leather : Leather as a part of sustainable lifestyle. (World Leather; 27, 5; 2014, Oct./Nov.; 46-7).

Discusses that many companies in the luxury sector are committed to advancing good social, environment and animal welfare practices, including sustainable sourcing practices. Discusses also the important implications, for tanneries in the strategies such as footwear, clothing and accessories which are made from leather of these companies which are being offered by the several companies as well as are already looking quite for ahead. (1 Photo).

49.15001

A cultural revolution. (World Leather; 27, 5; 2014, Oct./Nov.; 22-3).

Describes the development of a whole new spin-off called Proviera Biotech which is currently targeting the technology at tanneries around the world. Attempted the developments of several products, which are based on the actions of beneficial microbes in tanning. (3 Photos).

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