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.

JOURNAL OF INDIAN LEATHER TECHNOLOGISTS' ASSOCIATION (JILTA)

NOVEMBER' 2016 VOL.: LXVI NO.: 11 RNI NO.: 2839/57 REGD.NO.: ISSN 0019-5738

Contents

Hony. Editor :

Dr. Goutam Mukherjee

Communications to Editor through E-mail :

jiltaeditor@gmail.com; admin@iltaonleather.org

Cover Designed & Printed by :

M/s TAS Associate

11, Priya Nath Dey Lane, Kolkata - 700 036

Published & Printed by :

S. D. Set, on behalf of Indian Leather Technologists' Association

Published from :

Regd. Office : 'Sanjoy Bhavan', 44, Shanti Pally

3rd Floor, Kasba, Kolkata - 700 107

Printed at :

M/s TAS Associate

11, Priya Nath Dey Lane, Kolkata - 700 036

Subscription :

Annual	Rs.(INR)	400.00
Foreign	$ (USD)	45.00
Single Copy	Rs.(INR)	50.00
Foreign	$ (USD)	4.00

All other business communications should be sent to :

Indian Leather Technologists' Association

'Sanjoy Bhavan', 3rd floor, 44, Shanti Pally

Kasba, Kolkata - 700 107, WB, India

Phone : 91-33-2441- 3429 / 3459

Telefax: 91-33-2441- 7320

E-mail : admin@iltaonleather.org; mailtoilta@rediffmail.com

Web site : www.iltaonleather.org

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).

The Journal of Indian Leather Technologists' Association (JILTA) is a monthly publication which encapsulates latest state of the art in processing technology of leather and its products, commerce and economics, research & development, news & views of the industry etc. It reaches to the Leather / Footwear Technologists and the decision makers all over the country and overseas.

Advertisement Tariff

Full Page / per month

Black & White	₹ 5,000.00 /-	for 03 months ₹ 20,000/-
Colour (3 plans)	₹ 10,000.00/-	for 06 months ₹ 35,000/-
Colour Insert (One side)	₹ 5,000.00 /-	for 12 months ₹ 60,000/-
(Provided by the Advertisers)		

Full Page / per anum

Front inside (2nd Cover)	₹ 96,000 /-
3rd Cover	₹ 84,000 /-
Back Cover	₹ 1,20,000 /-

Printing & Processing charges extra

Mechanical Data

Overall size: 27cm × 21 cm
Print area : 23cm × 17 cm

A/c. Payee Cheque to be drawn in favour of :
Indian Leather Technologists' Association
and Payable at **Kolkata**

Send your enquiries to :
Indian Leather Technologists' Association
'SANJOY BHAVAN'
3rd floor, 44, Shanti Pally, Kasba, Kolkata – 700 107
Phone : 91-33-24413459/7320, Telefax : 91-33-24413429
E-mail : admin@iltaonleather.org / mailtoilta@rediffmail.com
Website : www.iltaonleather.org

INDIAN LEATHER TECHNOLOGISTS' ASSOCIATION

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

Executive Committee (2015-17)

Central Committee

President:
Mr. Arnab Kumar Jha

Vice-Presidents:
Mr. Asit Baran Kanungo
Dr. K. J. Sreeram
Mr. P. K. Bhattacharjee

General Secretary:
Mr. Susanta Mallick

Joint Secretaries:
Mr. Jiban Dasgupta
Mr. Shiladitya Deb Choudhury

Treasurer:
Mr. Kaushik Bhuiyan

Committee Members:
Mr. Aloke Kr. De
Mr. Aniruddha De
Mr. Bibhas Chandra Jana
Mr. Kanak Kr. Mitra
Mr. Mrinal Kanti Chakraborty
Mr. Pradipta Konar
Mr. Sudhansu Kumar Biswas
Mr. Deepak Kr. Sharma
(Secretary of Northern Region)
Dr. J. Raghava Rao
(Secretary of Southern Region)

Ex-Officio Member
Dr. Goutam Mukherjee

Regional Committees

Southern Region :

President:
Mr. N. R. Jaganathan

Vice-President:
Dr. B. Chandrasekaran

Secretary:
Dr. J. Raghava Rao

Treasurer:
Dr. Swarna V Kanth

Committee Members:
Mr. S. Govardhan
Dr. S. V. Srinivasan
Mr. R. Mohan
Dr. Subendhu Chakraborty
Dr. J. Kanakaraj

Northern / Western Region :

President:
Mr. Jai Prakash Saraswat

Vice-President:
Mr. Kamal Sharma

Secretary:
Mr. Deepak Kr. Sharma

Treasurer:
Mr. Jaswinder Singh Saini

Committee Members:
Mr. Mohinder Lal
Mr. Rajeev Mehta
Mr. Sudagar Lal
Mr. Sunil Kumar

JOURNAL OF INDIAN LEATHER TECHNOLOGISTS' ASSOCIATION [JILTA]

EDITORIAL BOARD OF JILTA

LEATHER SCIENCE ABSTRACT [LESA]

: EDITORIAL BOARD :

India surging ahead

Indian economy is showing signs of gaining momentum in mid year of FY 2016. Business confidence picked up in the April - June period and households are benefiting from favorable tailwinds due to rises in public sector pay and a near-normal monsoon. In addition, the current account came close to balancing in Q2 of FY 2016 due to a lower oil bill and subdued gold imports—highlighting the country's reduced vulnerability to external risks. However, the economy is not firing on all cylinders and growth has been uneven across sectors. Reducing stress in banks' balance sheets is vital to boosting credit growth and supporting fixed investment, which plunged in Q1 FY 2016 and dragged down GDP growth. The majority of bad debt is held by state-owned banks and policymakers are considering consolidating some indebted lenders.

Moderate Growth

Economic growth in India lost significant momentum in the first quarter of the fiscal year 2016, dragged down mainly by a contraction in fixed investment and disappointing growth in private consumption. GDP increased 7.1% annually in the April to June period, which came in below the 7.9% rise recorded in the final quarter of the fiscal year 2015. The result, which marked the slowest expansion in five quarters, was worse than the 7.6% expansion that analysts had expected. Still, India remains the fastest growing among any major economies in the world. Looking at the details, one of the key contributors to overall economic growth in the first quarter of FY 2016 was government spending, which was up a strong 18.8% in the April to June period. This was the fastest increase since 2014 and reflected higher spending in subsidies and infrastructure. However, growth in government spending will moderate in the coming quarters as the government seeks to rein in the increasing fiscal deficit. Also, the newly-approved Goods and Services Tax is not expected to start benefiting government revenues until FY 2017. Private consumption and gross fixed capital formation disappointed in the first quarter. Private spending increased 6.7% in the first quarter of FY 2016, which was a marked slowdown over the 8.3% increase in Q4 FY 2015 due to weaker urban demand. That said, household consumption is likely to gain momentum in the coming quarter as pay increases for government workers and a robust monsoon bolster urban and rural demand. A concerning result was a second consecutive contraction in gross fixed investment. It fell 3.1% in Q1 FY 2016, faster than the 1.9% contraction in the previous quarter. This suggests that business sentiment remains weak and that the government's efforts to propel stalled projects, clean up banks and boost public investment have not yet galvanized investment in the private sector. Unlike private consumption, the outlook for fixed investment remains lackluster owing to stress in banks' and corporate balance sheets. Calls on the government to increase banking sector recapitalization funds will probably grow in the light of new data. The external sector's performance improved markedly in Q1 FY 2016. Exports of goods and services increased for the first time since the three-month period to December 2014. Imports contracted further and fell 5.8% in Q1 FY 2016, which was faster than the 1.6% decrease recorded in the previous quarter. Although there is still a long way to go, the first quarter result casts doubt on the government's projection that the economy will expand 8.0% this fiscal year. The latest result also puts pressure on Urjit Patel, who succeeds Raghuram Rajan as Reserve Bank of India governor in September, over whether to raise interest rates at the October monetary policy meeting.

Industrial production Scenario

The fall in industrial production moderated in August, after recording the largest contraction since November 2015. Industrial output contracted 0.7% compared to the same month last year, which was a less pronounced decline than July's revised 2.5% decrease (previously reported: -2.4% year-on-year). The print nevertheless undershot market analysts' expectations of a greater improvement to a 0.2% contraction. August's result was driven by gains in the manufacturing sector. Manufacturing output improved from a 3.5% contraction in July to a 0.3% fall in August. However, mining production swung from a 0.9% expansion to a 5.6% fall in August—the worst result since May 2013. Electricity output grew 0.1%, down from July's 1.6% increase.

On a use-based classification, the production of basic and capital goods gained steam in August. However, output of intermediate and consumer goods slowed. The trend continued to point downward. Annual average growth in industrial production eased from July's 1.3% to 0.7%, which represented a 28-month low.

Goods and Services Tax Bill

India's Parliament approved an overhaul of the indirect tax system on 3 August, in one of the most significant economic reforms since the country became independent. The upper house of Parliament passed the Goods and Service Tax (GST) constitutional amendment bill—first proposed a decade ago—which is designed to streamline the country's fragmented tax system and bring significant efficiency gains to the economy. In the short term, the economic impact of the bill is likely to be mixed, but in the long run the reform should boost growth, widen the tax base and improve the country's business environment. While the exact impact of the GST Bill will depend on many details which have yet to be determined, at this stage, a number of broad benefits can be seen for the economy in the long run. First, the reform will streamline the country's current burdensome tax structure, replacing a number of state and central government levies with one unified sales tax, improving the ease of doing business in India. The measure should also end tax cascading, the piling-up of multiple taxes, which can distort incentives within the economy. In addition, the bill will turn the country into a single customs union with a single tax used across states, reducing business costs and removing the need for state customs checks. Finally, the reform should lead to better tax compliance as companies will receive offsets for taxes paid at different points of the supply chain, providing an incentive to ensure that taxes are paid at each stage. These factors together will provide a significant boost to India's growth trajectory in the long-run. In the near-term, the picture is less rosy. Currently, services in India are taxed at around 15%, much less than goods at approximately 25%. Under the GST Bill, both groups will be taxed at the same rate, which is expected to be in the middle ground (a government panel has recommended 17–18%). This will result in a one-off rise in services prices, which account for a larger proportion of GDP compared to goods. This one-off impact could temporarily push up inflation and reduce consumption. Regarding government revenues, the short-term impact is unclear. The central government has promised to compensate states for any lost revenues during the first five years of implementation, so any temporary disruption in tax revenues will be borne by the central government. The GST Bill had been held up for months in the parliament and has

now overcome the largest roadblock to implementation. That said, a number of steps remain to be taken and the government's target to implement the tax by April 2017 is ambitious. Several changes have been made to the legislation that must go back to the lower house for approval and the bill needs to be ratified by a majority of state assemblies. In addition, three pieces of enabling legislation must be passed and a GST council must decide on key aspects of the new tax structure. The recent passage of the GST bill confirms the government's commitment to reform implementation, which is supporting India's bright outlook. Focus Economics Consensus Forecast panelists' foresee GDP expanding 7.5% in FY 2016, which is unchanged from last month's forecast. For FY 2017, the panel also expects the economy to grow 7.5%.

Scenario of interest rates

The newly face lifted Reserve Bank of India (RBI) decided to ease monetary policy at a scheduled meeting on 4 October, cutting the repurchase rate from 6.50% to 6.25%—an over five-year low. The move surprised market analysts and was the first decision by the recently appointed monetary policy committee, headed by new Central Bank governor Urjit Patel. All six members of the monetary policy committee voted for a rate cut. Accordingly, the Bank also decided to reduce the marginal standing facility rate (Bank Rate) to 6.75% and the reverse repurchase rate to 5.75%. India's policy makers have found themselves in a desirable position as the economy is growing robustly, while once elevated price pressures have moderated. In its accompanying statement, the Bank outlined that the decisions are consistent with its accommodative stance and designed to support growth while achieving the inflation target of 5.0% by Q4 FY 2016. The Bank highlighted that the government's recent measures to cool food inflation have opened up space for monetary policy easing in India.

Regarding growth, the Bank maintained its projection for the economy at 7.6% in FY 2016, with risks evenly distributed around the forecast. The Bank pointed out that a hike in public sector salaries along with the normal monsoon should boost household spending, while private sector firms are benefiting from favorable liquidity conditions and accommodative monetary policy. However, the external sector is expected to remain a sore point in India's economy as sluggish global trade and smaller terms of trade advantages persist. Looking forward, the RBI is expected to continue its accommodative stance as price pressure evolve on a favorable path and many of our analysts expect a further easing in monetary conditions.

Price pressures Scenario

In September, consumer prices fell 0.23% from the previous month, which followed August's flat growth. The monthly decrease reflected lower prices for food and beverages. Inflation continued to fall in September, declining from August's 5.0% to an over one-year low of 4.3%. As a result, inflation is now broadly at the center of the Central Bank's target of 4.0% plus/minus 2.0 percentage points. The wholesale price index (WPI) in September fell 0.16% from the previous month, which followed August's 0.44% decrease. The overall decline in the index was driven by falling prices for primary articles, while prices for fuel and power

products as well as manufactured goods rose. Wholesale price inflation inched down from 3.7% in August to 3.6% in September. The trend pointed up and the annual average variation in wholesale prices jumped from minus 0.2% in August to plus 0.5% in September.

The Indian rupee lost ground in recent months and closed 19 February at 68.5 INR per USD. The figure represented a 1.2% depreciation over the same day of the previous month and a 10.3% depreciation over the same day of last year. The result marks more than a two-and-a-half year low and the currency is approaching its all-time low of 68.8 tallied in August 2013. The steady decline in value comes against a backdrop of global risk aversion trigged by concerns about the global economy. Heightened global uncertainty has put Indian stock markets under pressure and has led to a broad selloff of Indian stocks at the outset of 2016. In addition, strong demand for the U.S. dollar has fuelled the depreciation.

Narrower Trade deficit

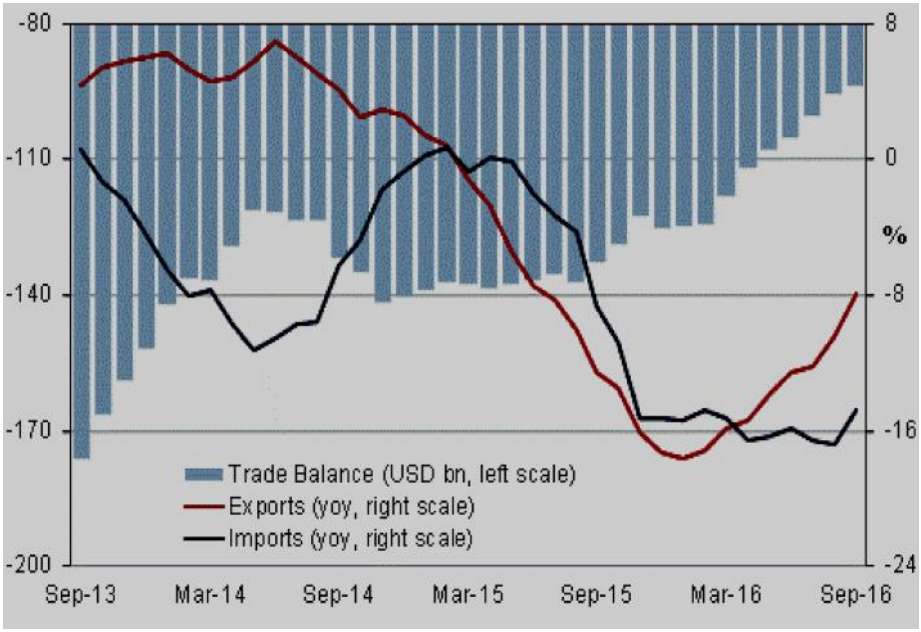
Recently-released data related to India's external sector showed that the trade deficit totaled USD 8.3 billion in September, which was a smaller shortfall than the USD 10.2 billion gap recorded in September 2015 (August 2016: USD 7.7 billion deficit). The rolling 12-month trade deficit narrowed from USD 95.4 billion in August to USD 93.5 billion in September, which is the smallest accumulated shortfall since December 2009. The improvement in trade data came on the back of a pick-up in export growth and a slight contraction in imports. Imports totaled USD 31.2 billion in September, which represented a 2.5% fall from the same month last year (August 2016: -13.5% year-on-year; September 2015: -26.1% yoy). Meanwhile, export growth picked up steam, rising from August's 1.2% over the same month last year to 4.6% (September 2015: -24.2% yoy). India's shipments abroad totaled USD 31.2 billion, which represented an over one-year high.

India Economy Data

	2011	2012	2013	2014	2015
Population (million)	1,211	1,227	1,243	1,260	1,276
GDP per capita (USD)	1,534	1,491	1,504	1,623	-
GDP (USD bn)	1,857	1,829	1,870	2,044	-
Economic Growth (GDP, annual variation in %)	6.7	5.6	6.6	7.2	-
Consumption (annual variation in %)	9.2	5.3	6.8	6.2	-
Investment (annual variation in %)	12.6	4.9	3.4	4.9	-
Industrial Production (annual variation in %)	3.0	1.1	-0.1	2.8	-
Public Debt (% of GDP)	68.8	67.7	66.2	66.4	-
Money (annual variation in %)	6.0	7.5	12.3	10.2	14.7
Inflation Rate (CPI, annual variation in %, eop)	9.0	10.5	8.2	5.3	4.8
Inflation Rate (CPI, annual variation in %)	8.5	10.2	10.0	5.9	4.9
Inflation (PPI, annual variation in %)	9.0	7.4	6.0	2.0	-2.5
Policy Interest Rate (%)	8.50	7.50	8.00	7.50	6.75
Stock Market (annual variation in %)	-10.5	8.2	18.9	24.9	-9.4
Exchange Rate (vs USD)	50.88	54.28	60.02	62.29	66.25
Exchange Rate (vs USD, aop)	47.89	54.37	60.42	61.14	65.42

	2011	2012	2013	2014	2015
Current Account (% of GDP)	-4.2	-4.8	-1.8	-1.4	-
Current Account Balance (USD bn)	-78.8	-87.4	-32.8	-27.6	-
Trade Balance (USD billion)	-183.8	-189.5	-136.6	-137.3	-118.5
Exports (USD billion)	306	300	314	311	261
Imports (USD billion)	490	490	451	448	380
Exports (annual variation in %)	21.7	-1.8	4.6	-1.2	-15.9
Imports (annual variation in %)	32.4	0.1	-8.0	-0.7	-15.2
International Reserves (USD)	295	293	304	341	356
External Debt (% of GDP)	19.4	22.4	23.9	23.3	-

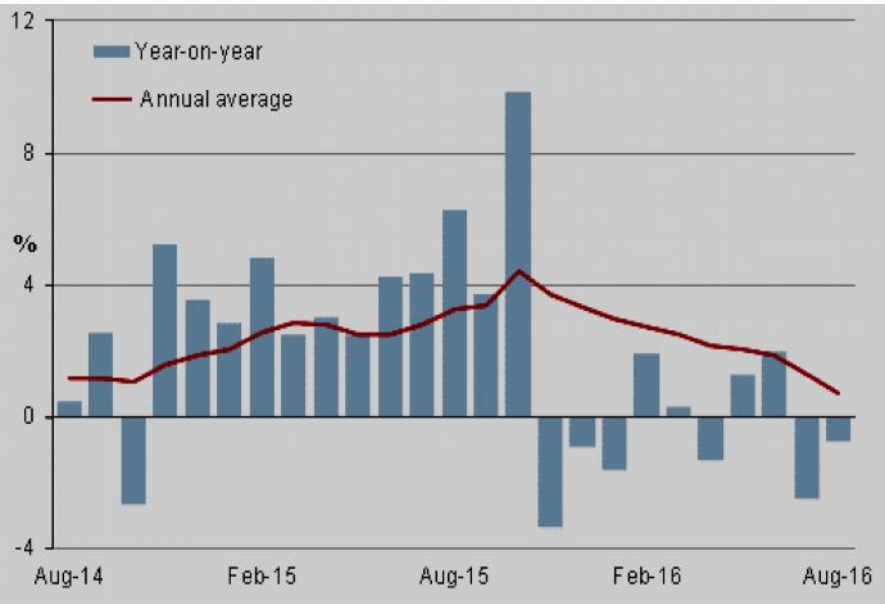
India Trade Chart



Note: 12-month sum of trade balance in USD billion and annual variation of the 12-sum of exports and imports in %.

Source: Ministry of Commerce and Industry and FocusEconomics calculations.

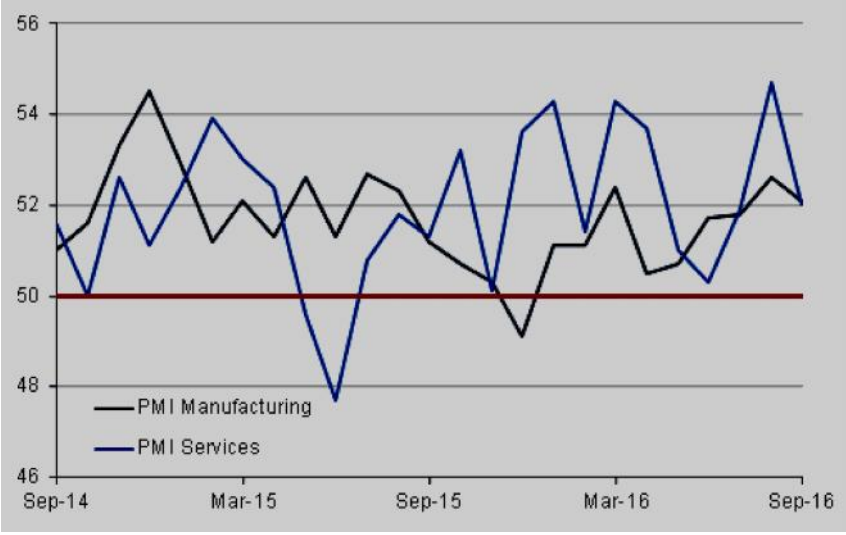
India Industry Chart



Note: Year-on-year and annual average variation of industrial production index in %.

Source: Ministry of Statistics and Programme Implementation (MOSPI) and FocusEconomics calculations.

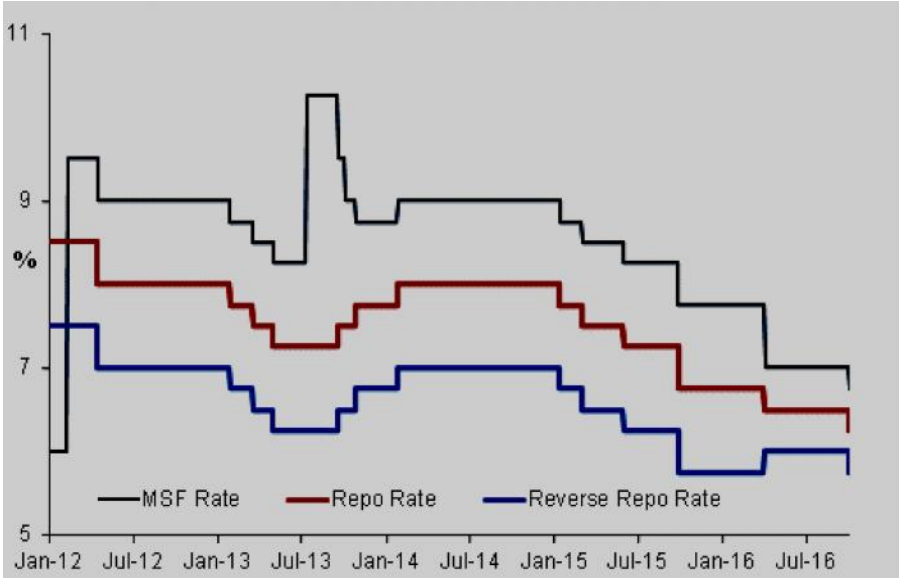
India PMI Chart



Note: Nikkei India Purchasing Managers' Index (PMI). A reading above 50 indicates an expansion in business activity while a value below 50 points to a contraction.

Source: Nikkei and IHS Markit.

India Monetary Policy Chart



Note: Marginal Standing Facility (MSF) Rate, Repo Rate and Reverse Repo Rate in %.

Source: Reserve Bank of India (RBI).

Goutam Mukherjee

Dr. Goutam Mukherjee


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
INTERNATIONAL UNION OF LEATHER TECHNOLOGISTS AND CHEMISTS SOCIETIES
ORGANIZERS
CSIR-Central Leather Research Institute (CSIR-CLRI)
Indian Leather Technologists' Association (ILTA)
INDIA PARTNERS
Council for Leather Exports (CLE)
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.

Updates on Deadlines for submission of abstracts and Easier Registration for Executive Committee Members of the IULTCS Committee

The Congress committee has now decided to squeeze itself a little bit. The deadlines for submission of abstracts for the congress have now been extended to **7th November 2016**. The same would be reflected in the congress website from 31.10.2016 as well. Please pass this message to all your associated members and institutions. With the cooperation of the reviewers, we may still keep all other deadlines as such.

Some facts that could make the participation of your members at the Indian Congress easy are:

a. Registration fee of USD 300 for individuals and USD 250 for groups of 5 and more - extended early bird till November 15, 2016.

b. Accommodation available from USD 45 per night (double room) to USD 130 per night - only through the Congress secretariat - subject to confirmed booking by 15th November 2016.

This includes breakfast, congress lunch and dinner on 5, 6, 7 and breakfast and lunch on 8th, pickup and drop facilities for those staying in accommodations arranged by the Congress secretariat.

Source: Email from Dr. K. J. Sreeram, Congress Secretariate, dated – 31/10/2016.

58th Annual General Meeting:

58th Annual General Meeting of the Association was 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 normal business.

After the Welcome Address', the Chairman read out the names of the following members whom we have lost since last AGM and requested the audience to observe one minute's silence to pay respect to their departed souls.

1. Samir Kr. Bose
2. B. B. Chaki
3. Shyamapada Karmakar

Confirmation of the proceedings of the 57th AGM held on 24th Sep' 2015 was followed by adaptation of the Audited Balance Sheet and the Statement of Accounts for the F.Y. 2015 – 16 and the Annual Report during the same.

M/s Ray & Ray, was appointed as the Auditor of the Association for the F.Y. 2016 – 17.

Schedule of LEXPOs in FY 2016 – 17:

Ground allocations from competent authorities have been received for holding LEXPOs at Durgapur, Kolkata and Siliguri during F.Y. 2016 – 17. The Fair period will be as follow :

Durgapur LEXPO – IV	:	31/12/2016 – 15/01/2017	(16 days)
Kolkata LEXPO – XXXX	:	04/02/2017 – 19/02/2017	(16 days)
Siliguri LEXPO – XXIII	:	11/03/2017 – 26/03/2017	(16 days)

Discussion on a Footwear Project:

As it was discussed in the 493rd E.C. Meeting, on Thursday the 27th September'2016, Mr. Shome Nath Ganguly, visited ILTA office as well as the 4th floor of ILTA Building along with Mr. Apurba Bhattacharya, a senior Footwear expert for implementing a footwear development project at ILTA building for the benefit of the industry.

The primary objective of this project will be to extend support to the footwear industry by organizing short term training courses and supplying some basic components for designing and manufacturing of footwear.

Mr. Ganguly stated that a complete project report on the Product Development including Sample making, Designing, Forma & Last making of footwear and marketing of the same jointly with ILTA will be submitted to the Executive Committee of ILTA within a short while.

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.

Continued from last issue

D- Pickling

It is the last Beam-house operations, in which adjustment pH of hides before chrome tanning and thus to reduce the astringency of the chrome tanning agents, by other meaning to conditioning the hide for receiving the tanning agent and prevents precipitation of chromium salts.

a- Traditional process

Formic acid and its sodium salt was used as a good pickling agent and/or another chemicals include 5-10 % of common salt (sodium chloride) or sodium sulfate and 0.6-1.5% acid of sulfuric, hydrochloric, acetic or formic, or mixtures. During neutralization of the pelts in the pickling unit the pH of the collagen has to be shifted to the isoelectric point and the state of swelling has to be changed. Boric acid, sodium bisulfate, ammonium sulfate, and very recently sodium bicarbonate or carbon dioxide has been proven in practice. They can be offered in excess without causing acid swelling. A most important point is, that the float should be as short as possible, to obtain the highest concentration possible of the neutralizing agents. Pickling process accelerates penetration of the chrome tanning materials and sometimes also vegetable tanning materials and makes the leather softer.

b- Biotechnological process

Enzymes are not directly involved in this stage.

E- Degreasing

The degreasing process aimed at eliminating excess grease from fatty skins (sheep, goat and pigs). The presence of natural fats in skin is facilitating the formation of insoluble chrome-soaps or fat spues (white fatty material expressed to the leather surface) at a later stage (as dyeing and finishing). Degreasing process can become necessary to attain good leather quality especially for the production of soft glove and clothing leather.

a- Traditional Process

Traditional methods of removal involve the use of anionic or non-ionic surface-active agents,

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

or solvents (as Kerosene, chlorinated hydrocarbons, and white spirit). Surface active agents enable the process to be carried out in the aqueous phase but the results are not always satisfactory. Although solvents are more effective, they require a series of preliminary operations that increase costs, prolong processing times and result in severe ecological problems which add to the toxicity of the environment and effluents as well as highly unsafe and hazardous to the workers [16].

These detergents and solvents add to the BOD load of the pickling effluent, and the chlorinated hydrocarbons and solvents add to the toxicity of the effluent [16].

The degreasing process can be broken down into three successive stages:

i. Breakdown of the protein membrane of the fat-containing sac,
ii. Removal of the fat, and
iii. Emulsification of the fat in water or solubilization in solvent.

If one of these phases is carried out incorrectly or inadequately, the whole degreasing process will be unsatisfactory.

b- Biotechnological Process

Enzymatic degreasing is suggested as a viable alternative to surfactant and solvents. **Lipases** are a type of enzymes that specifically degrades fat and so cannot damage the leather itself. Lipases hydrolyze not just the fat on the outside of the hides and skins, but also the fat inside the skin structure.

Recently, a range of lipases for degreasing were worked in different pH (acidic, neutral and alkaline) conditions. **Alkaline lipases** are applied during soaking and/or liming, preferably in combination with the relevant protease. Among other things, the protease opens up the membranes surrounding the fat cell, making the fat accessible to the lipase. This facilitates the production of waterproof and low-fogging stock. Lipases can also be applied in an acid process, e.g. for pickled skin or wool-on and fur, or a semi-acid process for wet blue.

An enzymatic preparation, therefore, needs a triple-action (proteolysis, lipolysis and emulsification) to be an effective degreasant. Therefore, combination of alkaline lipase with proteinase and pancreatin was used to improve the degreasing effect in softening pigskin [48]. It has been suggested that a combination of enzyme and enzyme-compatible surfactants has a synergistic effect in soaking and bating, thereby enabling optimum wet-degreasing of rawhides, pelts and wet blues [16]. A combination of enzymes might be necessary not only to breakdown grease but also to release the broken-down products from the hide.

The main advantages of using lipases over solvents or surfactants are :

1) improved fat dispersion
2) a more uniform color and a cleaner appearance, while solvents tend to dry out the skin and give it a pale color.
3) improve the production of hydrophobic (waterproof) leather.
4) low-fogging leathers for car upholstery. This is the term for the build-up of a film of chemicals on the inside of car windscreens.
5) elimination of solvents, reduction in surfactants, and possible recovery of valuable by-products.
6) Lipases represent a more environmentally sound method of removing fat.

The disadvantages are :

1) lipases do not remove all types of fats in the same way that solvents do,
2) They add cost to the process.
3) For sheepskins, which contain up to 40% fat, the use of solvents is very common and these can also be replaced with lipases and surfactants.

F- GENERAL RAMARKABLES OF ENZYMES IN PRE-TANNING PROCESSES

1. The main advantages are specificity, stereo specificity, activity under mild conditions, and possibility of producing 'natural' products, non-pollutants, and biodegradability.
2. In order to overcome the hazards caused by the tannery effluents, use of enzymes as a viable alternative has been resorted to in pre-tanning operations such as soaking, de-hairing, bating, degreasing and offal treatment.
3. Nowadays, microbial enzymes can be used as an alternate technology to the conventional methods, and high lights the importance of these enzymes in minimizing the pollution load [54].
4. The consumption of chemicals and the impact on the environment can be minimized using enzymes as a viable alternative technology for pre-tanning processes.
5. Enzymes from plants, animals, and microbial sources have been used for decades; large-scale use of microbial enzymes received a boost by introduction of fermentation technology.
6. The enzymes or enzymatic formulations need not be pure but must be cheap compared to that of commercial chemicals used in leather industry.
7. Animal proteases and microbial proteases from bacteria and fungi are used in the pre-tanning processes of leather manufacture.
8. The most important criteria for their selection are their specificity, pH activity range as well as thermal stability.
9. The animal proteases are mixtures of *trypsin, chymotrypsin*, and various peptidases which may contain amylase or lipase as secondary enzymes. Mainly for economic reasons,

enzymes from microorganisms have come to play a significant role in recent years and enzyme products of microbial origin are already being produced on a wide scale.

10. Microorganisms can be made to propagate rapidly and profusely, they are an ideal source for enzymes.
11. Mainly, neutral and alkaline proteases are obtained from bacteria, which differ in their pH activity range.
12. Fungal proteases are also classified according to the pH activity range:
13. Fungal acid proteases act between pH 2.5 and 6.0 which can be derived from A. satoi. These are used for bating prior to pickling and serve to open up the fiber structure.
14. Fungal alkaline proteases belong to the same group of serine proteases as alkaline bacterial proteases. However, these are more heat sensitive and are quickly deactivated above 60° C.
15. Fungal neutral proteases are mainly obtained from *Aspergillus* or *Penicillium* species.
16. 13- Specific proteases are known keratinases which hydrolyse keratins, are obtained from *Streptomyces fradiae* and can be used for de-hairing.
17. Today, proteases are used for soaking, bating and enzyme-assisted de-hairing.
18. The use of lipases to dissolve and remove fat is under rapid development and lipases are now an integrated part of leather processing in many parts of the world.

II-2- Tanning Process :

Tanning process is the key operation that transforms raw hide into leather through the reaction of the fiber network with tanning materials [15]. The purpose of tanning is to produce an irreversible stabilization of the skin substance that is prone to putrefaction. This means that, tanning is to preserve the fiber structure form bacterial attack. The object of converting pelt into leather by tanning is to :

1. Stabilize it against enzymatic degrading and increase its resistance to chemicals.
2. Raise its shrinkage temperature and increase its resistance to hot water.
3. Reduce or eliminate its ability to swell.
4. Enhance its strength properties.
5. Lower its density by isolating fibers and enhance the porosity of its fibers texture.
6. Reduce its shrinking in volume, area and its deformability.

These effects are achieved by cross-linking the collagen chains with various tanning agents. Stabilization of collagen is attributed to the formation of new chemical cross links in the matrix protein [15].

a- Traditional Process

Tanning agents are broadly classified into two major heads :

a) Organic Tanning Agents

In which vegetable tanning agents [55-57] synthetic tanning agents (syntans) [58-59] and modified aldehydes are included.

b) Inorganic Tanning Agents

Among the inorganic tanning agents, are those of chromium salts and to a lesser extent aluminum, silicon, iron, titanium and zirconium [60-63]. Although salts of a number of other metals such as zinc, thorium, molybdenum, vanadium, tungsten and cobalt are also reported to have tanning action. This variety leads to different effluent loads [64-67].

b- Biotechnological Process

Another important area where biotechnology can be used is in the tanning process itself. It will be interesting to discover whether enzymes or biomolecules are able to tan skins and hides. The creation of enzyme-catalyzed cross links to stabilize the collagen matrix of the hide would enable the production of leather to become more environmentally friendly, thereby increasing the sustainability of the tanning industry. Such a development would not only lead to a completely biodegradable leather product but also comply with various eco-labeling criteria. It is also imperative to address several other questions. Is it possible to produce robust enzymes for mishandling (e.g. use in overdose)? How can the bioprocesses be controlled? How can the techniques be made 'idiot-proof '? Could the chemical leather sector adapt to these changes ?

From practical viewpoint, until now, it is well known that no enzymatic tanning agents until now. This means that, Enzymes are not directly involved in this stage. But, a combination of acid lipase and mild acid protease was reported to clean the surface of chrome-tanned stock from grease, scud and other stains, and provide uniformly colored leathers [68].

II-3- Finishing Processes (application of aesthetic materials):

A-Wet–Finishing

It's to build onto the tanned fibers characteristics of fullness, color, softness and lubrication as well to finish the fiber surface to produce a useful product. These processes include retanning, neutralization, dyeing and fat-liquoring operations. The wet finishing processes are sometimes performed in a one single float.

a-Traditional Process

Retanning process aims at filling up of the meatuses of the already tanned leather.

Neutralization is conditioning the pH values of the chrome tanned leather for dyeing and fat-liquoring treatment.

Dyeing is the impregnating the material with the desired color.

Fat-liquoring is the proper lubrication of leather fibers by rubbing oils and natural fats, which determining the characteristics of leather.

b-Biotechnological Process

Another avenue of interest that has been explored is the use of enzymes at the post-tanning stage [69, 70]. Kanth et al. (2008) [71] study the application of a bacterial collagenase in leather dyeing. The authors obtained a high uptake of dye (99%). While, using the conventional process the exhaustion of dyes was found to be 85%. The utilization of enzymes improved the softness of leather, while the strength characteristics are not significantly altered.

B- Dry Finishing (Mechanical Treatment)

The transforming raw hides into finished leather proceed by several mechanical steps. Most of them are to separate connective and adipose tissues, and to remove useless parts of the surface of hides and leather, to reduce the level of the thickness and to remove damaged grain. Mechanical changes of the superficial appearance and of the rheological features (plasticity and elasticity) of the article "anchorage" of a polymeric aesthetical covering film to the derma. Other mechanical processes like samming, buffing and trimming can be applied. The mechanical and coating treatment steps during finishing enhance the appearance of the leather and give special properties to the grain and flesh surfaces.

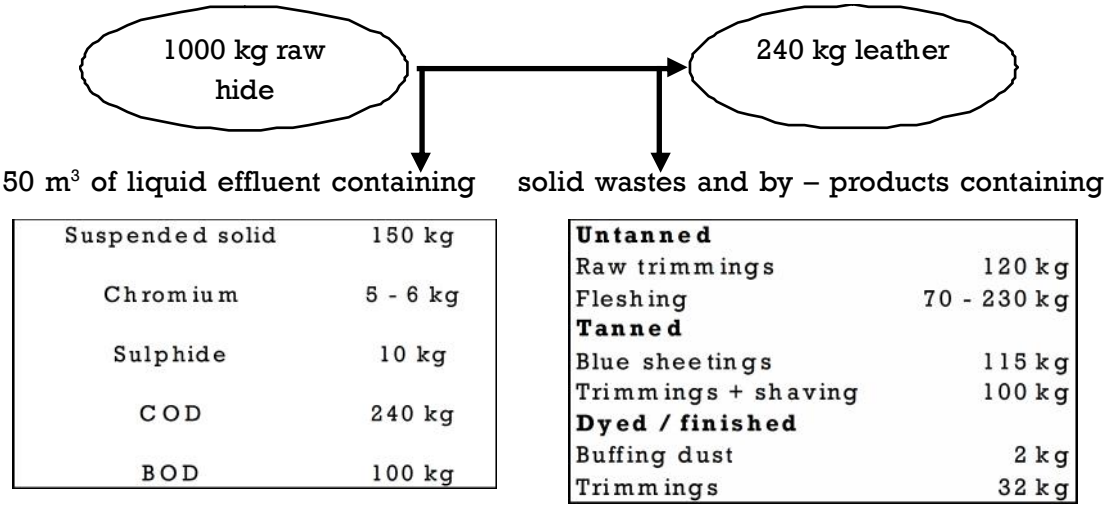
III- ENVIRONMENTAL CONCEPT

In the last decades, there are growing concerns on the negative environmental impacts of industrial development. Leather making is one of these industries. However, leather and the environment can be described as two sides of the coin [72]. However, a detailed analysis of the environmental consequences of tanning is also crucial. Despite the leather industry making traceable and visible impacts on socio-economic through employment and export earnings, the industry has gained a negative image in society owing to the resulting pollution [73].

III-1. Environmental of Concept of Leather Processing :

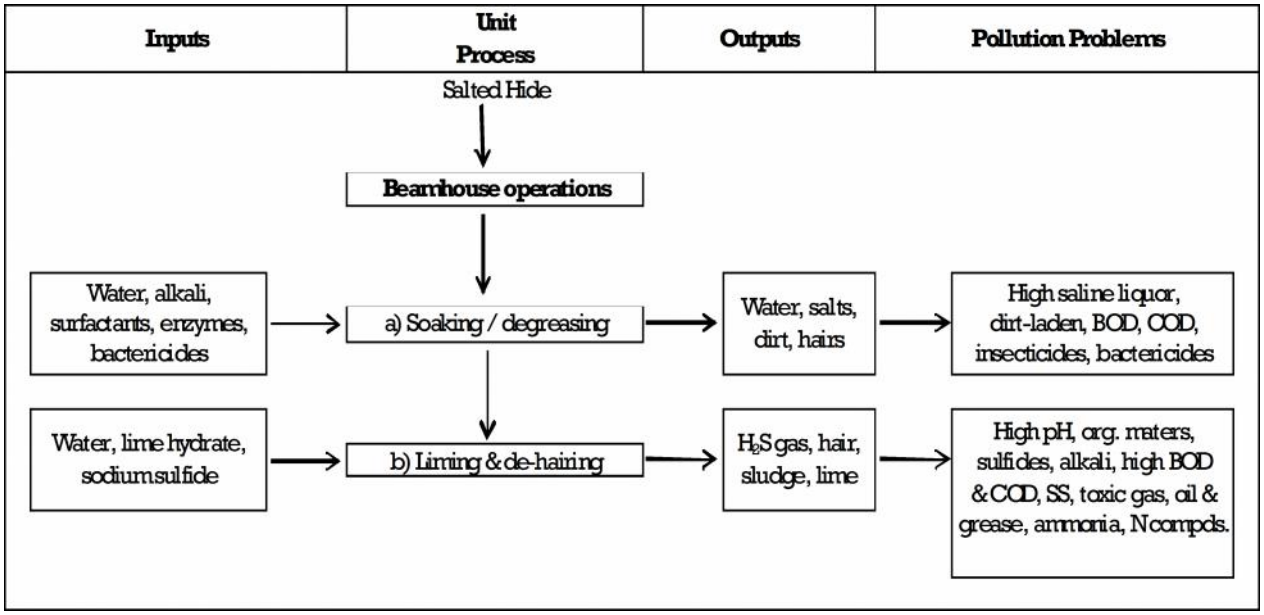
The environmental impact of leather waste from tanneries has been a subject of extensive scientific and technical dispute. Liquid and solid wastes are produced, with regards to the environment; waste water is the most significant source of pollution, followed by solid wastes and by-products generated in nearly each one of the numerous production steps [65]. The transformation of hide into leather generates a fair amount of pollutants.

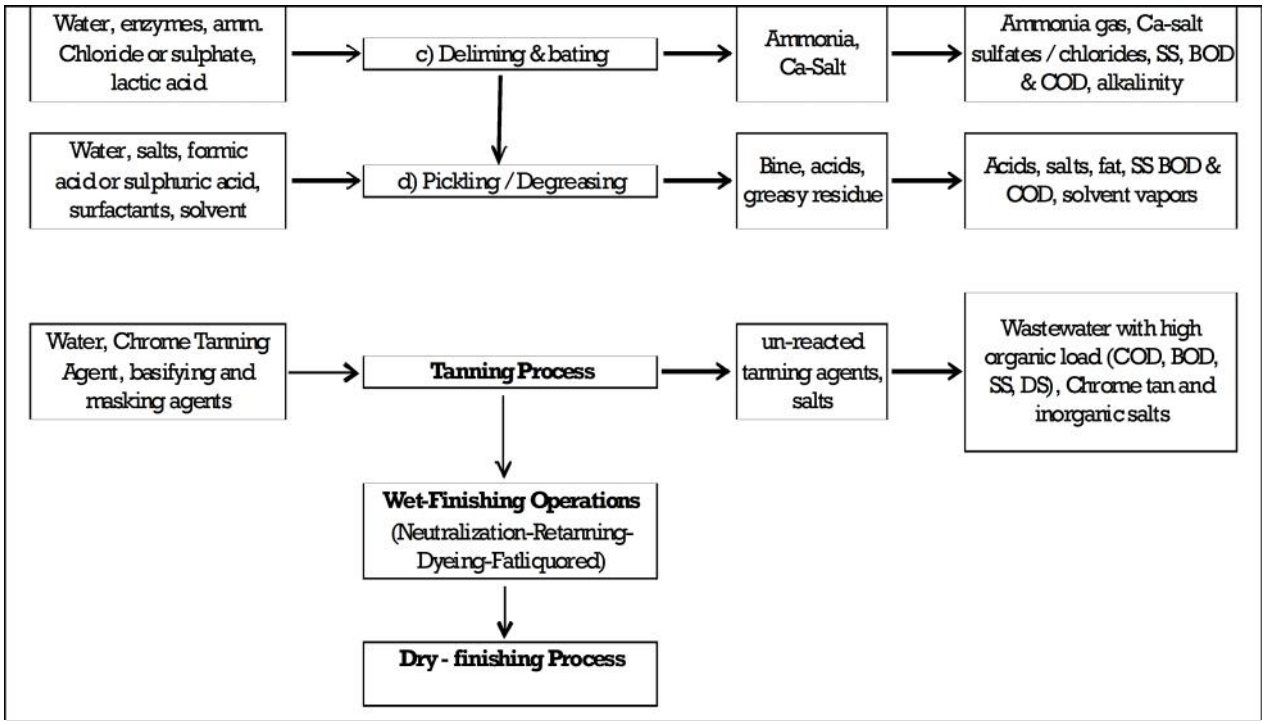
As shown in Scheme (1) one ton of raw hides yield an average of 240Kg leather, up to 600Kg solid wastes (shaving, trimming, fleshing and dust) and approximately 50 m^3 of liquid effluents [74]. Environmental pollution is a difficult problem for world leather industry [75,76]. The yearly world production 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. Beam-house, chrome wastes and dyed liquor from leather processing possess a significant disposal problem.



Scheme (1): Environmental input and output in leather processing.

In general, scheme (2), shows the schematic diagram of environmental impacts associated with the leather production and the chemicals which can be used in each process and the by - products a combined for each process. Leather production generates a large amount of pollutants, 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 (like hydrogen sulfide) are generated during the leather making 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.





Scheme (2): Schematic diagram of environmental impacts associated with traditional leather processes

Hence, the pollutants can be classified in two main parts

1- pre-tanning wastes (beam-house operations)
2- post-tanning wastes.

III-2- TREATMENT OF BEAM-HOUSE WASTES

Tanneries are among the oldest industries, transforming hides into leather through a cascade of several unit operations. To date, the de-hairing steps use sulfides and a large amount of chemical products. According to Jian et al. (2011) [21], the conventional lime sulfide process leads to the destruction of the hair, causing emissions with high chemical oxygen demand (COD), biological oxygen demand (BOD), and total suspended solid (TSS) loads in the effluent of these industries. Moreover, the use of lime in the de-hairing process requires its removal, usually by the addition of ammonium salts, which represents high amounts of nitrogen in the stream of wastewater, one of the main contaminants of liquid effluents (Gutterres et al., 2011) [77].

A-Traditional Treatment

The de-hairing-liming operation is undoubtedly the largest contributor to the most pollution for tanneries. It generate a large quantity of by- products and wastes than of

finished leather [65]. Conventionally, mixing hides with lime and sodium sulfide lead to residual floats. The float containing 55% of suspended solids, 55% of COD, 70% of BOD_5, 40% of nitrogen and 76% of the toxicity of tannery effluent, as shown in table 2. The standard of sulfide in lime/unhair effluent is 1-2 mg/L. However, it has been stated that sulfide could be treated to zero. It is not possible to de-haire hides by any sulfide/lime process and depletes the sulfide to such levels. According to the current legislation on the environment, it has become necessary to replace the most polluting processes, highly toxic and recalcitrant pollutants, by less polluting technologies.

B-Biotechnological Treatment

Hides and skins contain proteins and fat between collagen fibers. Proteins and fats can be removed by proteolytic enzymes and lipases respectively. Also, It is possible to preserve the hair during the liming phase through proteases enzymes which can be considered less toxic than sulfide. This process can lead to a COD reduction of 15 to 20% for the mixed effluent, and a total nitrogen decrease of 25 to 30% [67]. Residual hair can be used, however, for fertilization and composting.

In this aspect, biotechnology can be considered to have a great potential in developing environmentally friendly technologies.

Table 2: Analyses of pollution parameters and load from the effluent of de-hairing processes of bovine hide.

Parameters	Conventional	Enzymatic
(a) Effluent parameters (mg l/1)		
TDS	41760	7020
TSS	19860	2920
BOD	12300	1800
COD	36300	3680
Ca^{2+}	3080	–
Sulfide	5750	–
pH	12.4	7.6
(b) Effluent load (kg t/1)		
TDS	30.48	5.58
TSS	14.5	2.32
BOD	8.99	1.43
COD	26.5	2.93
Ca^{2+}	2.25	–
Sulfide	4.2	–

a)- Soaking Enzymes

Alkaline Proteases, with a pH optimum around 9-10, are now widely used to clean the stock and facilitate the water uptake of the hide. Soaking is usually carried out using a combination of proteolytic enzymes that are optimally active in the neutral or alkaline pH range. The environment advantages of soaking enzymes are: Better fiber opening, Shorter wetting times and less chemical used (NaOH, wetting agent, etc..), and consequently less pollution.

b)- Liming and De-hairing Enzymes

The Proteases enzyme digests the basal cells of the hair bulb and the cells of the malphigian layer. This is followed by loosening of hair with an attack on the outermost sheath and subsequent swelling and breakdown of the inner root sheath and parts of the hair that are not keratinized.

The environment advantages of Liming and De-hairing enzymes :

Enzymatic de-hairing is suggested as an environmentally friendly alternative to the conventional process. Tanneries are concerned about the obnoxious odor and pollution caused by the extremely toxic sulfide used in the de-hairing process. Deaths due to this toxic chemical have even been reported. Also, it is possible to reduce the COD up to 50% and BOD up to 30% in waste discharges. Sivasubramanian S., et.al, [78] illustrated that TDS and TSS of enzymatic de-hairing effluent were greatly reduced by about 85% compared to de-hairing with lime/sulfide, Table 2. This could be due to the elimination of sludge forming, sparingly soluble lime in the process.

Analysis of effluent from enzymatic de-hairing devoid of lime and sulfide showed that TSS, TDS, BOD and COD were not only reduced to a greater magnitude but also toxicity due to sulfide was completely eliminated [79]. It could be noticed that the pH of the effluent was near neutral, indicating that it was less toxic. In addition, treatment of an effluent with neutral pH would be less expensive than that having a high alkaline pH.

c)- Bating Enzymes

Bating with enzymes is an indispensable operation of leather processing to obtain best quality of leather and cannot be substituted with a chemical process. By combining a two types of protease the tanner gets an excellent bate with synergistic effects which can be applied to all kinds of skin and hide.

The environment advantages of Bating enzymes are :

1. Over come to the unpleasant, unreliable and slow effect methods

2. The desired result of a clean grain with both softness and tightness is achieved in a short time.

d)- Degreasing Enzymes

Enzymatic degreasing is suggested as a viable alternative to combat the pollution problems caused by the use of solvents and detergents. Lipases catalyze the breakdown of fats and can be obtained from animal, microbial and plant sources. Lipases are a type of enzyme that specifically degrades fat and so cannot damage the leather itself. Recently, a range of lipases for degreasing which work in different pH (acidic, neutral and alkaline) conditions.

The environment advantages of Degreasing Enzymes :

1. Elimination of solvents, reduction in surfactants, and possible recovery of valuable by-products.
2. Lipases represent a more environmentally sound method of removing fat.
3. Lipases cannot damage the leather fiber and more cheep than surfactant and solvents.

III-3- TREATMENT OF CHROME TANNING WASTES

Chrome tannage has proven to be the effective method of tanning and is done in tanneries worldwide. Chrome tan (trivalent) is a well-established to produce high quality leather. But, chromium wastes are the main concern from an environmental stand point, because chrome wastes possess a significant disposal problem. Another concern in tanneries is the use of chromium and the possibility of its conversion to toxic forms (Fuck et al., 2011) [80]. Special attention is required for the disposal of solid wastes because of the large amounts that are generated and legal restrictions (Yilmaz et al., 2007) [81].

Tanned leather waste, is a serious problem. The toxicity of chromium compounds are reported for both animals and plants. In the land co-disposal method, leaching of Cr (III) from the tanned leather wastes to groundwater due to acid rain limits the dumping process. Conversion of Cr (III) to Cr (VI), which is a well known carcinogen, is possible during incineration. Soluble hexavalent chromium is produced as long as small quantities of alkali and carbonates are present. The amount of chrome tanning material released is directly proportional to the concentration of chrome tanning material in the residual tanning float, measured in g Cr_2O_3/ liter. The sludge contains a high level of Cr (III) concentration as 3000-6000 mg/L and must be treated as hazardous solid waste, this usually costs very much. Also, chrome shavings leather waste which produces from wet-blue leather in a traditional process.

A-Traditional Treatment

Balancing chrome in leather processing, i.e., maximizing the chrome uptake in the tanning process and minimizing the amount of liquid/solid chrome waste, is a matter of great concern

to all tanners. In practice, Recovery and Recycle method were used for chrome balance. These technologies based upon treatment of both effluent and solid waste to recovery of chromium.

FIRSTLY: LIQUID WASTE

Chromium is regenerated by one of the following methods :

A - Precipitation

1. Chromium can be recovery from effluent as chromic acid and/or metallic chromate salts by direct precipitation of chromium using $BaCO_3$ in aqueous solution of acidified with glacial acetic acid, at an acidic pH preferably ranging from 4.5-7.5, followed by filtering.
2. Chromium was removed by adjusting the pH to 10.0-10.5 with lime liquor and settling for 24 hr.
3. Precipitation of chrome as hydroxide using NaOH, CaO or MgO. Total precipitation with Na_2CO_3 offers best.

B – Adsorption

1. Adsorption of Cr (III) from tannery waste water on a semectite or on kaolinite.
2. Ion exchange resins were used to remove /recovery of chrome from waste water. It was achieved by IRN 77 and SKNI cation exchange resins [82]. Also, acidic exchange resins as Amberlite IRC 76 and Amberlite IRC 718 as a weekly acidic exchange resins and amberlite IR 120 as a strong acidic exchange resin were used [83].
3. Chelating ion exchange resins were studied for removal of chromium from aqueous waste. Macroporous resins containing iminodiacetic acid (IDA) groups and lewatit TP 207 were investigated [84].
4. Passing the effluents on columns packed with calcium olignate (CA) beeds with or without humic acid (HA) [85].

   Hexavalent chromium has significant treatment due to its toxicity. Many researches were developed to determine and eliminate Cr (VI) as follow :

C- Reduction & Sedimentation

1. The waste water is treated at low pH with both a reducing agent for converting Cr (VI) to Cr(III) and with a ferric or aluminum sulfate or chloride salt. Then, pH of the acidic solution is raised, using an inorganic base, to a pH sufficient of chromic hydroxide formation [86].

D - Adsorption

1. Adsorption of hexavalent chrome as HCrO4- at pH below 8.5with iron (III) hydroxide [87].
2. By activated carbons prepared from Casurina equisetifolia leaves. This method shows that 65-80% of chrome was adsorbed [88].

3. Also, different low- cost abundant adsorbents as wool, olive cake, sawdust, pine needles, almond shells, cactus leaves [89], and coals [90] were used.
4. Adsorption on micro- and mesoporous rice husk- based carbon (RHC) [91], or high surface area (HSA) activated carbons [92]. Where their adsorption capacity is several times larger than that of commercial carbons [92].

Removal of chromium (VI & III) from tannery effluent can done successfully by passing the effluent through a column packed with Al_2O_3 which effectively removed both Cr VI & III. A similar result obtained by Nashy et al, with a natural material (cement dust) containing Al_2O_3. This is cement dust collected in the filters of cement industry [93].

SECONDLY: SOLID WASTE

As illustrated above in Scheme (1) one ton of raw hides yield an average of 240Kg leather, up to 600Kg solid wastes (shaving, trimming, fleshing and dust). Therefore, special attention is required for the disposal of solid wastes because of the large amounts that are generated and legal restrictions. chromium wastes and dyed scraps are the main concern from an environmental stand point, because chrome wastes possess a significant disposal problem. Another concern in tanneries is the use of recovered chromium and the possibility of its conversion to toxic forms. Figure (5) show some examples of solid wastes (white shaved and chrome tanned dyed scraps).

Figure (5-a): chrome tanned dyed scraps

Figure (5-b): white shaved

Various treatment methods have been developed for treatment of solid leather wastes during this period.

Continued to next issue

Now available

Sl. No.	Title of the Book	Author	Price per Copy*	
			Inland (INR)	Foreign (USD)
01.	Treatise on Fatliquors and Fatliquoring of Leather	Dr. Samir Dasgupta	₹ 1500.00	$ 60.00
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
04.	Analytical Chemistry of Leather Manufacture	Mr. P. K. Sarkar	₹ 300.00	$ 10.00
05.	Synthetic Tanning Agents	Dr. Samir Dasgupta	₹ 900.00	$ 30.00
06.	Hand - Book of Tanning	Prof. B. M. Das	₹ 750.00	$ 25.00
**** Packing & Forwarding Charge Extra***				

Send your enquiries to :-

Indian Leather Technologists' Association
'SANJOY BHABAN'
3rd Floor, 44, Shanti Pally,
Kolkata-700 107
Phone : 91-33-24413459 / 24417320,
Telefax : 91-33-24413429
E-mail : admin@iltaonleather.org / mailtoilta@rediffmail.com

RAYMOND TO ENTER ETHNIC WEAR, FOOTWEAR CATEGORIES

Textile and apparel manufacturer Raymond is planning to enter the ethnic wear and footwear category by end of October, GauravMahajan, President, group apparel, said on the sidelines of India Retail Forum.

He said that the company is planning to enter new categories and increase its product assortments to tap growth in these segments. In footwear, the company would focus on both made-to-measure as well as readymade stuff.

According to ArvindSinghal, Chairman, Technopak, "Ethnic wear brands in the country like Fabindia, Biba, W among others are very successful as demand is strong in this category and Raymond is also likely to benefit from it. However, I am not too sure about the growth in footwear category." The company is in the process of revamping its existing 1,000 Raymond shop stores to Raymond Store of the Future, as it plans to digitize the stores with more smart features like providing tab to customers inside the store to browse the entire collection available. The company has also shut around 10 loss making stores in the last one year, Mahajan said.

The group owns apparel brands like Raymond, Raymond Premium Apparel, Park Avenue, ark Avenue Woman, ColorPlus and Parx.

(Financial Express – 22.09.2016)

EXPORTS SAG 0.3% ON POOR LEATHER SHIPMENTS

Contracting for the second month in a row, India's exports dipped 0.3% to $21.51 bn owing to decline in shipments of products like leather.

The outward shipments stood at $21.58 billion in August-2015. The country's imports too contracted by 14 percent to $29.91 billion, leaving a trade deficit of $7.67 billion in August-September'2016, which is the lowest figure in three months.

The trade gap narrowed in August-September this year from $12.4 billion in the same month last year, according to the data released by the commerce ministry.

The main export sectors that recorded negative growth in the month include leather (7.82 percent) and chemicals (5 percent). Reacting to data, the Federation of Indian Export Organization (FIEO) said the decline has largely been arrested and now "we can look for positive growth from October onwards".

(Political & Business Daily – 16.09.2016)

What you may lose if you do not file your Income Tax Return by July' 31st

The due date for filing income tax return for individuals-July 31 - is fast approaching but several people think that if one has paid all one's taxes there is no adverse consequence even if one misses the tax return filing deadline. However, this is not correct. Even if all your taxes have been paid you would still lose out on certain benefits if you do not file your income tax return by the due date.

Cannot revise a belated return

"If you file your income tax return for FY 2015-16 after the due date you cannot file a revised return later in case you discover a mistake in the one originally filed", says Kuldip Kumar, Partner and Leader Personal Tax, PwC. This essentially, means that in case you discover that you had forgotten to declare some income in the return or made a wrong statement and you later wish to file a corrected or 'revised' return you cannot do so for FY 2015-16 in case the original return is belated, he explains. In such a case, if your mistake is discovered by the income tax assessing officer then he would not accept a 'revised return' and the mistake would be penalized as per rules. In effect you lose the facility of admitting to a mistake on your own and correcting it without being penalized - wherever a penalty is applicable.

The rule that belated returns cannot be revised comes from Section 139(5) of the Income Tax Act. However, it is to be noted that this section has been amended - w.e.f. April 01, 2017 - by Budget 2016 to allow even those who file a belated return to revise that return later. So it would be possible to revise belated returns filed after 1.4.2017 i.e. for FY2016-17 but returns filed for FY 2015-16 are not covered under this amended provision. Hence, there is no scope of revising a return filed after the due date July 31, 2016 for the FY 2015-16, clarifies Kumar.

Loss in interest on refunds

In case you claim a refund in your return of any advance tax paid/TDS, you would lose some of the interest (currently 6% per annum paid by the tax department) on such refund. The interest on refund is normally computed from April 1 of the assessment year (the year immediately following the financial year for which the return is filed) till the date of grant of refund, says Kumar. However, in case of a belated return (i.e. return filed after due date) interest is computed from the actual date of filing the return till the date when refund is granted. This means loss of the interest that would have been paid for the period April 1 till date of filing the return. Even if you file the return one day after the due date you would be losing interest for at least four months - April, May, June and July (presuming due date is not extended beyond July 31).

No carry forward of losses

If you file a belated return you cannot carry forward losses (except loss from house property). "Losses under the following heads of income: Income from business and profession including speculation business, capital gains, and income from other sources cannot be carried forward in case a belated return is filed by the tax payer. The return filer will not be allowed to carry forward these losses even if all taxes have been paid in time if the return is belated," says PwC's Kumar.

Delayed return where tax remains unpaid

If you have any unpaid tax liability, filing your return after the due date would result in levy of penal interest @ 1% per month from the due date of filing the return till the actual date of filing. This would be a heavy and avoidable payout. What is more, tax authorities can initiate prosecution if the return is delayed beyond the relevant assessment year and the amount of unpaid tax exceeds Rs. 3,000, he adds.

If return is not filed even by end of relevant Assessment Year

If you do not file your tax return even by 31st March of the relevant assessment year (i.e. the year immediately after the financial year for which the return is to be filed) but no taxes are due, a penalty of Rs. 5,000 can be levied by the tax authorities if you are unable to provide a reasonable cause for the delay, Kumar adds.

Since 1950

LESA

LEATHER SCIENCE ABSTRACTS

VOLUME 49 **NUMBER 10** **OCTOBER, 2016**

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

CENTRAL LEATHER RESEARCH INSTITUTE
ADYAR, CHENNAI 600 020, INDIA

Leather Science Abstracts **(LESA)** is published by National Information Center for Leather and Allied Industries **(NICLAI),** Central Leather Research Institute **(CLRI)**, Chennai.

It is a monthly abstracting periodical covering significant papers/articles published in the fields of Leather Science and Technology, Footwear Technology, Leatherware and Leathergoods, Leather chemicals, Leather machinery, Leather economics etc., appearing in about 500 scientific and technical periodicals published all over the world. The abstracts are presented under well defined subject headings and include indexes.

All enquiries for further details should be addressed to: THE DIRECTOR, **(ATTN.: EDITOR, LESA)** CENTRAL LEATHER RESEARCH INSTITUTE, ADYAR, CHENNAI-600 020, INDIA.

Since 1950

LESA

CONTENTS

VOLUME 49 **NUMBER 10** **OCTOBER, 2016**

List of Periodicals covered in this issue :

List of Periodicals Covered in This Issue :

Angew.Chem.

Aqeic. Bol. Tecn. (Spanish)

Chem. Ind. Dig.

Chem. Wkly.

Indian J. Biotechnol.

Indian J. Pure Appl. Phys.

Indian J. Sci. Technol.

Indian Leather

J. Am. Leather Chem. Assoc.

J. Indian Leather Technol. Assoc.

J. Sci. Ind. Res.

J. Soc. Leather Technol. Chem.

Leather Int'l

Leather News India

Spectrosc. Europe

Spinco Biotech Cut. Edge

World Footwear

World Leather

LEATHER SCIENCE AND TECHNOLOGY

LEATHER INDUSTRY.HISTORY.MANAGEMENT.ECONOMICS. EDUCATION

49.15002

Socio-historical approachtowards Japanese leatherworkers : A cross-cultural perspective. YUKO (N), (J. Soc. Leather Technol. Chem.; 98, 4; 2014, Jul.-Aug.; 143-50).

This paper reflects the social status of Japan's leather workers; whose social position has been degraded for centuries by the concept of untouchability and pollution by focusing on their social history.(24 Ref.).

49.15003

Sustainability-The way forward for the Indian leather industry. TOMKIN (M), (M/s. Stahl Holdings bV.,Sluisweg 10, 5145 PE Waalwijk, Netherlands). (Indian Leather; 48, 4; 2014, Aug.; 31-6).

Defines the term viz. : 'Sustainability'. Discusses in detail about the importance of sustainability and CSR(Corporate Social Responsibility) for the growth and progress of the Indian leather industry. (1 Fig.; 3 Photos).

49.15004

In defence of free trade. SOTHMANN (S), (United States Hide, Skin and Leather Association(USHSLA), No. : 1150 Connecticut Avenue, North West 12th Floor, Washington 20036, District of Columbia, USA). (Leather Int'l; 216, 4841; 2014, Jun.;6&8).

The debate regarding export restrictions for hides and skins is not new to the leather industry. However, the introduction of new restrictions by various governments has markedly increased recently in response to higher global hides and skins prices. This topic is revisited and the raw material quality and availability issues, currently affecting the entire leather value chain, are sought for the address. (1 Photo).

49.15005

Nothing to hide : Issues of deforestation. (World Leather; 27, 3; 2014, Jun./Jul.; 13).

Aimed for some examples, that were already in place in the country, representing the evolution of these practices that should be looked into and showing how the meat and leather industry can grow, generating wealth, social development and at the same time foster conservation of natural areas. (1 Photo).

49.15006

Nothing to hide :The value of livestock in the fight against poverty and malnutrition. (World Leather; 27, 4; 2014, Aug./Sep.; 13).

Looked at the oft quoted myth that 'raising livestock is unfair' and drawn a fact that one billion animals help to feed the world's poor and also generate income. Explains the value of meat to 1.2 billion poor, the value of dairy products, of livestock to the women of community as it is mostly they who herd and feed the animals thus helping their economic status. Many of the poor are in rural communities and the keeping of livestock has obvious advantages in regard to availability of food.

49.15007

Nothing to hide :What it means to keep animals. (World Leather; 27, 4; 2014, Aug./Sep.; 14&16-7).

The meat industry's big players these days are major corporations, many of them quoted on the world's most important stock exchanges. They are the source of the bulk of the hides and skins that the world's tanners transform into leather and are often far from free of criticism from groups who campaign against livestock farming and against meat. It is felt as a very good thing if one is asking for better standards and great sustainability in the meat and livestock industry and this part of the series on 'Nothing to Hide' shows that there are many reasons why communities to raise animals and continue to eat meat. In this case, the important livestock and meat that must have to health, wealth and wellbeing of people in this developing world. (9 Ref.; 3 Photos).

49.15008

Nothing to hide: Positive change is taking place. **(**World Leather; 27, 3; 2014, Jun./Jul.; 14-6&19).

Details a wide range of ideas and initiatives, which is making a big difference to the livestock sector in Brazil, allowing beef (and leather) production there to increase while becoming more different and more sustainable. (10 Ref.; 3 Photos).

49.15009

Drivers of gas prices in India.TANNAN (SK), (Allabar School of Management, Raffles University, Japanese Zone, National Highway No. : 8, Neermana-301 020, Rajasthan State, India). (Chem. Wkly.; 60, 3; 2014, Aug.,26; 211-5).

The share of gas in the fuel sector is growing around the world and in India. Discusses briefly about the various factors that hamper the progress of production of gas particularly the natural gas. Discusses briefly also about the fixation of gas pricing, concerns about raising the price of gas, the Rangarajan formula that expects the price in India to be an average of two prices,

Cost-push inflation, wishful expectation, Indian gas production trend, demand for natural gas, Import of LNG(Liquified Natural Gas), formation of theCommittee on Roadmap for Reduction in Import Dependency in Hydrocarbon Sector by 200 and the inefficiencies in the gas sector. (12 Ref.; 4 Photos).

49.15010

Laboratory and industrial catalytic reactors-Part 1. SHARMA (SK), PAL (VKSN), JASRA (RV), (Reliance Technology Group, M/s. Reliance Industries Limited, Room Nos : 24 and 35, 2nd Floor, MaterialsBhavan, RIL, VMD, P.O. Petrochemicals, Vadodara-391 346, Gujarat State, India). (Chem. Wkly.; 59, 45; 2014, Jun., 17; 205-9).

Describes the reactors as an integral part of any chemical process. Selection of a catalytic reactor depends upon the nature of reaction, reaction phases and parameters such as pressure, temperature residence time, conversion, selectivity, heat & mass transfer between different phases. Reactants and catalyst properties like safety, easy operability, lower capital and operation cost also influence the choice of a reactor. Discusses the classification of reactors with their advantages and disadvantages, reactor selection criteria for homogeneous and heterogeneous processes and scale up of a process.(1 Tab.; 7 Fig.).

49.15011

Advanced process control : squeezing maximum profit from plants. GHOSH (A), (M/s. AspenTech, South Asia Region, #04-20/23 Galaxis 1, Fusionopolish Place, Singapore 138522, Singapore). (Chem.Wkly.; 59, 52; 2014, Aug., 5; 216-8).

Describes in detail about the Advanced Process Control(APC), which is a time-proven technology that maximizes operational performance and process profitability which is enabling companies to get much more from their assets. (1 Fig.;2 Photos).

RAW HIDES AND SKINS

49.15012

Histological analysis of the skin dermal components in bovine hides stored under different conditions. MONTELLI (S), CORAIN (L), COZZI (B), PERUFFO (A), (Department of Comparative Biomedicine and Food Science, University of PadovaViale Dell'Universita 16, 35020 Legnaro (PD), Italy). (J. Am. Leather Chem. Assoc.; 110, 2; 2015, Feb.; 54-61).

The leather industries are interested in avoiding post-mortem alterations of the skin components, since degradation of the dermal structures composing raw hides decreases the quality of leather. It aims to realize a histological study of skin samples to assess the tissue alterations at different periods and under methods of conservation(salting and refrigeration) after the skimming of the animals at the slaughterhouse. Analyzed both the

papillary region and the reticular dermis.The dermal components considered were the number of cell nuclei, the structure of the collagen and elastic fibers and finally the presence of acidic polysaccharides. Results showed as progressive reduction of cellular nuclei and acid polysaccharides of the dermal layer during the passage of time in all the considered conditions. Noted a moderate decay of collagen bundles in salted hides whereas the elastic fiber networks maintained their organization over the time. No sign of accumulation of non-functional elements or other morphological alternatives were observed in the dermis. These findings can be useful for the leather industry for choosing the desired curing and timing conditions to employ during refrigeration or salt-based treatment of the skins. (33 Ref.; 2 Tab.; 8 Fig.).

49.15013

Theory of Sampling(TOS)-fundamental definitions and concepts. ESBENSEN (KH), WAGNER (C), (Geological Survey of Denmark and Greenland/Aalborg University, Fredrick BajersVej 5, 9220, Aalborg, Denmark).(Spectrosc.Europe; 27, 1; 2015, Feb.; 22-5).

Introduces the important parameters and principles of Theory of Sampling(TOS). They first cover Lot dimensionality where the number of effective dimensions are specified which need to be covered by the sampling process. The reminder of this article is concerned with defining terms used in sampling.(20 Ref.; 4 Fig.).

ENZYMOLOGY

49.15014

Rapid fiber opening process for skins : An approach for fail-safe chemical-free process. DURGA (J), RANJITHKUMAR (A), RAMESH (R), ROSE (C), MURALIDHARAN (C), (Leather Processing Division, Council of Scientific and Industrial Research-Central Leather Research Institute(CSIR-CLRI), Adyar, Chennai-600 020, India). (J. Am. Leather Chem. Assoc.;110, 1; 2015, Jan.; 7-12).

Conventional beam house operations adopted by the global tanning industry are coming under the close scrutiny of the environmentalists on account of the possible adverse effect on human health and environment. Lime, which is used to the tune of about 10% on the weight of the raw hides and skins, in re-liming stage contribute to generation of large quantities of sludge, the disposal of which is a serious concern. Also the process duration to achieve the required fiber opening in the re-liming process is very long, ranging from 24-72 hours for different substrates and endproducts. Advocated the enzyme based beam house processes to overcome the problems associated with the conventional processes. However, enzyme based methods need greater control over process parameters to achieve satisfactory results in leather processing and avoid damage to the pelt. Attempted the cocktail of carbohydrates, which is to be used for fiber opening of hides and skins to overcome the problems associated with the conventional re-liming process. Studied the fiber opening at optimized concentration of the above enzyme for its efficiency on goatskins. A process using optimum quantity of enzyme led to fiber opening in 30 minutes. Studied also the efficacy of

enzyme on rapid fiber opening of dehaired skin at different experimental conditions of *p*H, time and enzyme concentration. Assessed the performance of the enzyme in the given experimental conditions by quantifying the removal of carbohydrate and proteoglycans and examining the fiber opening by scanning electron microscopic(SEM) studies. Evaluated the effect of enzyme on the final quality of the leather by changes in chemical characteristics, physical properties and visual examination.(14 Ref.; 7 Tab.; 1 Fig.).

49.15015

Determination of hydrolytic enzyme capabilities of *Halophilic archea*isolated from hides and skins and their phenotypic and phylogenetic identification. BILGI (ST), YAPICI (BM), KARABOZ (S), (School of Health, CanakkaleOnsekiz Mart University, Tozioglu Campus, Canakkale, 17100, Turkey). (J. Am. Leather Chem. Assoc.; 110, 2; 2015, Feb.; 33-42).

Aims to isolate extremely *halophilic archea* from salted hides, to determine the capabilities of their hydrolytic enzymes and to identify them by using phenotypic and molecular methods. Domestic and imported salted hide and skin samples obtained from eight different sources were used as the research material. Isolated 186 extremely halophilic microorganisms from salted raw hides and skins. Performed some biochemical, antibiotic sensitivity, *p*H, sodium chloride(NaCl), temperature tolerance and quantitative and qualitative hydrolytic enzyme tests on the isolates. Selected 34 of 186 isolates by taking into account the phenotypic findings of the research in this study. Identified these isolates by 16S recombinant ribonucleoroacid (rRNA) sequence analysis and also 15 different strains of extreme *halophilic archaea*. Additionally, identified 13 strains of these for the first time from salted raw hide and skin in this study including *Natrialbaaegyptia, Halococcusthailandensis, Halococcusdombrowskii, Halovinaxasiaticus, Halovinax sp. E107, Haloarchaeon, Natronococcus sp., Halorubrun sp., Halomicrobium Zhouli, Natronococcusjeotgali, Haloterrigenathermotolerans, Natrinemaversiforme, Halobacteriumnoricence.* At the same time detecting Natrialbaaegyptia in 6 of 8 hide samples showed that this strain is widely found in hide and skin samples. Research results are expected to contribute to other studies and solving microbial problems in leather industry. (58 Ref.; 1 Tab.; 3 Fig.).

49.15016

The treatment of collagen fiber and cattle hide with transglutaminase in supercritical carbondioxide. CHENG (H), WU (L), YIN (Z), CHEN (M), LI (Z), (National Engineering Laboratory for Clean Technology of Leather Manufacture, Sichuan University, Wangjiang Campus, Section No. : 24 of Southern Yichuan, Chengdu 610065, Sichuan Province, China). (J. Soc. Leather Technol. Chem.; 99, 5; 2014, Sep.-Oct.; 216-21).

Reported the supercritical fluids, that could increase the reaction rates and stability of enzymes. The transglutaraminase (TGase) was used as a cross-linking agent for collagen fiber and cattle hide in supercritical dioxide (SCF-CO_2) medium. Determined the denaturation temperature(Td) and shrinkage temperature(Ts) of the cross-linked samples. SCF-CO_2 could improve the cross-linking reaction of the TGase with the collagen fiber and cattle hide

according to the denaturation temperature determination. The Td of TG-SCF-collagen is about 20° Centigrade higher than that of TG-collagen in water medium for collagen fiber. While the Td of cattle hide treated with TGase in SCF-CO_2 is about 10°Centigrade higher than that of in water medium. Interestingly, the shrinkage temperature of the cattle hide did not show any change while it was treated by TGase both in SCF-CO_2 medium and in water. However, the appearance of the hide after TGase treatment was tighter and finer with the area reduction. Theresults implied that intermolecular cross-linking created by TGase did not like the cross-linking by chrome(**III**) tanning agents, which formed rigid structures among the collagen fibrils that play the main role for the increase of Ts of leather. (28 Ref.; 3 Tab.; 14 Fig.).

49.15017

Interest in the use of feather in the generation of new strains isolated from rotton bovine hides. DHULSTER (PDALP), (Aqeic Bol. Tecn.; 66, 1; 2015; 1-4). (Spanish).

Describes an innovative program that has been conducted to evaluate the interest of emerging technologies for calfskin unhairing. Describes also the screening and isolation of a new strain producer of protease to be used to replace traditional chemicals on the basis of a partnership with a laboratory specialized in biotechnologies and in enzyme and microbial engineering.

49.15018

A molecular level investigation of dialdehyde starch interaction with collagen for eco-friendly stabilization. JAYAKUMAR (GC), KANTH (SV), RAGHAVA RAO (J), BALACHANDRAN UNNI NAIR, (Council of Scientific and Industrial Research-Central Leather Research Institute(CSIR-CLRI), Adyar, Chennai-600 020, India). (J. Am. Leather Chem. Assoc.; 110, 5; 2015, May; 145-51).

Investigates DialdehydeStarch(DAS) as a stabilizing agent for collagen. DAS is a well established crosslinking agent for protein; however, molecular interaction with collagen was not elucidated. Dialdehyde involves in the formation of inter and intra crosslinking with protein which renders higher stability against heat and enzyme. Crosslinking efficiency of DAS with collagen was found to increase with increase in the concentration. DAS interacted collagen membrane exhibited an increase in the thermal stability of about 35°Centigrade at *p*H 8. Swelling degree of collagen-DAS membranes were found to decrease with increase in the concentration of DAS owing to the shift in the nucleation behavior in collagen fibrillogenesis. DAS treated collagen membranes shows 90% resistance to collagenase due to the unavailability of cleaning sites in collagen-DAS fibers. Reconstituted collage-DAS collagen membranes showed increase in cell proliferation which signifies its non-toxic characteristics. Therefore, DAS can be a new class of green tanning agent for skin stabilization and also finds applications in scaffold preparation. (25 Ref.;7 Fig.).

49.15019

Serum tissue non specific alkaline phosphate isoenzyme level and severity of chronic periodontitis.PERUMAL (GPL), MYTHILI (R), SENTHIL KUMAR, SUYAMUKESAN (S), (Department

of Periodontology, Penang International Dental College, Level 19021, NB Tower, 5050, JalanLuar, 12000 Butterworth, Pulace Pinang, Penang, Malaysia). (Indian J. Sci. Technol.; 7, 10; 2014, Oct.; 1551-4).

Aims to estimate and compare the levels of tissue non-specific alkaline phosphatase isoenzyme in serum of healthy individual and in chronic periodontitis patients with varying severity. Serum samples were obtained from 31 individuals. 10 from healthy individuals and 21 from chronic periodontitis patients categorized as mild, moderate and severe based on clinical attachment loss(CAL) values. The samples were used to determine the Tissue Non-specific Alkaline Phosphatase Isoenzyme(TNSALP) level. Evaluation and comparison of the TNSALP activity between the control and chronic periodontitis patient group showed a decrease in bone type of TNSALP level amongmild, moderate and severe chronic periodontitis patients group. The steady decrease in Bone type of TNSALP might help to provide useful information of monitored successfully over a period of time. (14 Ref.; 2 Tab.; 3 Fig.).

49.15020

Studies on a fibrinolytic enzyme from *Bacillus* species. GAD (RG), NIRMALA (S), SIVVASWAMY (SN), (Department of Bioinformatics, Faculty of Science and Humanities, SRM University, SRM Nagar, Near Potheri Railway Station, Kattankulathur-603 203, Kancheepuram District, Tamil Nadu State, India). (Indian J. Sci. Technol.; 7, 10; 2014, Oct.; 1632-42).

Two species of *Bacillus*, namely, *Bacillus amloliquefaciens* and *Bacillus lichniformis*, isolated from spoilt milk and soy flower, respectively, exhibited fibrinolytic enzyme(Nattokinase) activity. *Bacillus amyloliquefaciens* produced the Fibrinolytic enzyme in higher quantities, w26.98 FU/mL, compared to 26.63 FU/mL in *Bacilluslicheniformis*in the laboratory scale studies of these two cultures. The maximal activities were obtained after 72 hours. The optimum conditions at laboratory for maximal production of the fibrinolytic(Nattokinase) enzyme were : *p*H 7.2, temperature 37°Centigrade and agitation 200 rpm. The fibrinolytic activity of *Bacillus amloliquefaciens* was 55.6 at 72 hours in scale up trials in a 7 L fermentor. The molecular weight of the enzyme was estimated to be about 38 kDa. The enzyme had exhibited excellent blood cot dissolving property and therefore may be considered for further scale up and commercial exploitation. (23 Ref.; 4 Tab.; 12 Fig.).

LEATHERCHEMICALS AND AUXILIARIES

49.15021

cDNA cloning and expression of Acyl-CoA binding protein(A**C**BP) from orange-spotted grouper, *Epinepheluscoioides*. CITARASU (T), ZHOU (L), YANG (W), GUI (JF), (Center for Marine Sciences and Technology, ManonmaniamSundaranar University, Marina Campus, Rayakkamangalam, Kanyakumari-629 502, Tamil Nadu State, India and Fish Developmental Genetics and Cell Engineering, State Key Laboratory of Freshwater Ecology and Biotechnology, Institute of Hydrobiology, Chinese Academy of Sciences(CAS), No. : 7, Donghu

South Road, Wachung District, Wuhan 430 072, Hubei Province, People's Republic of China). (Indian J. Biotechnol. 12, 3; 2013, Jul.; 330-5).

Describes the Circular deoxyribonucleoroacid(cDNA) of acyl-CA binding protein(ACBP) that had been constructed, cloned and expressed in hypothalamus and pituitary of orange-spotted grouper, *Epinepheluscoioides*. The ACBP gene contains 630 nucleotides including the open reading frame(ORF) of length 128 bp. Started the open reading frame with (ATG) codon at the position 462 and terminated with a stop codon(TAA) at the position 600. The ORF sequence consisted of 42 amino acids and the calculated molecule weight of the protein was approximately 4.62 kDa. Observed the highest identify with the puffer fish, *Tetraodon nigraviridis*and*Anoplopoma fimbria* with homology of 83 and 88.1%, respectively. Reverse transcription–Polymer Chain Reaction(RT-PCR) results revealed that ACBP messenger ribonucleoroacid(mRNA) was abundantly expressed in pituitary, hypothalamus and modulla oblongata. Further, ACBP was cloned in pGEX-RG expression vector and transformed into BL21(DE3). Purified the protein by affinity chromatography and characterized partially. Indicated the abundant expression of ACBP in pituitary and hypethalamus that it might be involved in reproduction.(20 Ref.; 9 Fig.).

49.15022

Matrix assisted laser desorption/ionization mass spectrometry : Applications to macromolecules to small molecules. SRINIVAS (R), PRABHAKAR (S), PRASADA PRABHU (N), (National Center for Mass Spectrometry(NCMS), Council of Scientific and Industrial Research-Indian Institute of Chemical Technology(CSIR-IICT), Uppal Road, Tarnaka, Hyderabad-500 007, Telangana State, India). (Spinco Biotech Cut. Edge; 1, 1; 2013, Jul.; 7-12).

Describes the matrix-assisted laser desorption/ionization-mass spectroscopy (MALDI-MS) as a proven technique for the analysis of large size biomolecules like proteins and deoxyribonucleoroacid(DNA) molecules. The MALDI technique has been made popular for its application to a broad spectrum of molecules such as synthetic polymers, microorganisms and small molecules such as metabolites, lipids and synthetic nonpolar intermediates etc. apart from proteomics with the advent of developments in instrumentation with their abilities such as high sensitivity, high resolution, MS/MS capabilities etc. and in sample preparation techniques. (8 Fig.).

49.15023

Achieving ultimate MS/MS resolution in a MALDI TOF-TOF using ASDF. (Spinco Biotech Cut. Edge.; 1, 1; 2013, Jul.; 52-3).

Axial Spatial Distribution Focusing (ASDF) is considered as an unique patented method for ultimate Mass Spectrometry (MS/MS) in resolution in matrix assisted laser desorption/ ionization time-of-flight-time of flight (MALDI TOF-TOF). It focuses the axial spatial distribution with very high efficiency. It is used for achieving mass resolution of 10,000 full width at half

medium (FWHM) for MS/MS acquisitions. MS(MS resolution is largely independent of used laser influence with ASDF. (1 Ref.; 4 Fig.; 1 Photo).

49.15024

Using *p*H as a tool to improve reversed phase separations. (Spinco Biotech Cut. Edge; 1, 1; 2013, Jul.; 72).

*p*H is an easy, but often overlooked way to manipulate the retention time of "problematic" analyte pairs. However, it is important to avoid *p*H values at and around the pKa value of the analytes because the elution profiles become very broad and the retention times fluctuate greatly with small changes in the *p*H.(1 Fig.).

49.15025

Asymmetric ruthenium-catalyzed hydrogenation of 2- and 2,9-substituted 1,10-phenanthronines. WANG (T), CHEN (F), QIN (J), HE (Y), FAN (Q), (Beijing National Laboratory for Molecular Sciences, Chinese Academy of Sciences(CAS) Key Laboratory of Molecular Recognition and Function, Institute of Chemistry, CAS, Beijing 100190, People's Republic of China). (Angew.Chem.; 52, 28; 2013, Jul., 8; 7172-6).

Describes the title reaction proceeds in the presence of chiral cationic ruthenium diamine catalyst, (*R,R*)-1. Both chiral 1,2,3,4-tetrahydro- and 1,2,3,4,7,8,9,10-octahydro-1, phenanthroline derivatives that could be obtained in high yields with excellent enantio- and diastereoselectivity. (78 Ref.; 2 Tab.; 3 Schemes).

49.15026

Anharmonicity in thermal pressure for aluminium. SHARMA (SK), SHARMA (BS), KUMAR (R), (Department of Physics, Shivalik Institute of Engineering and Technology, Aliyaspur, Ambala-133 206, Haryana State, India). (Indian J. Pure Appl. Phys.; 51, 7; 2013, Jul.; 494-8).

An expression for the volume dependence of thermal pressure is formulated using basic thermodynamic identities. It is applied to aluminium metal for which sufficiently reliable data are available for comparison. The calculations are performed using the two models viz. the Thomas-Fermi model and the Stacey-Davis model. The values of thermal pressure for m=6 in both models are almost the same. Thermal pressure increases with the increase in pressure. The anhormic effects are found to be dominant below about (P=60 GPa). While above this, harmonic effects become dominant. The anhormic effects are very important at low pressures and become less significant as the pressure is increased. Values of thermal pressure have been calculated by taking into account the effects of the change in value on melting. The results obtained for aluminium indicate that the present model is capable of predicting the volume dependence of thermal pressure, which is found to be in good agreement with the available data for a wide range of pressures and temperatures. (33 Ref.; 1 Tab.; 2 Fig.).

49.15027

Phylogenetic and pathogenic analysis of Indian isolates of Newcastle disease virus. CHATURVEDI (U), RAVI KUMAR (G), DESAI (GS), SUDESH KUMAR, KALIM (S), SAHOO (AP), DASH (AP), TIWARI (S), RATTA (B), VEER SINGH (L), TIWARI (AK), (Molecular Biology Laboratory, Division of Veterinary Biotechnology, Indian Veterinary Research Institute(IVRI), Izatnagar-243 122, Bareilly District, Uttar Pradesh State, India). (Indian J. Biotechnol.; 12, 3; 2013, Jul.; 425-8).

Indian disease virus (NDV) isolates UP/3 and UP/4 collected from suspended field samples were characterized to be velogenic by pathogenic and phylogenetic analysis. Phlogeneticanalysis based on the nucleotide sequence of the F gene indicated that UP/3 and UP/4 isolates belong to genotype VII and genotype IV, respectively. These isolates possessed the amino acid sequence 112R/K-R-Q-K/R-R-F117 in the $F_o$cleavage site, which is typical of velogenic NDV pathotype. All the NDV strains analyzed have shown to have non-synonymous to synonymous demonstrating the presence of purifying selection. HN gene of the isolates was found to have an open reading frame encoding 571 amino acids. The deduced amino acid sequences of the HN glycoprotein revealed that the cysteine residues essential for intra-molecular disulphide bonds to stabilize the HN molecules, antigenic sites and key residues for receptor binding were all conserved in Indian isolates. (14 Ref.; 2 Fig.).

49.15028

Biosorption of methylene blue on chemically modified *ChaetophoraElegans*algae by carboxylic acids. MIKATI (F), El JAMAL (M), (Chemistry Department, Faculty of Sciences(**I**), Lebanese University, El Hadath, Lebanon). (J. Sci. Ind. Res.; 72, 7; 2013, Jul.; 428-34).

Chemical modification of *ChaetrophoraElegans* algae with carboxylic acids were undertaken in order to improve the methylene blue adsorption. The modified algae with 1 M acetic and formic acid showed an increase in the maximum uptake, but the modified algae with 1 M oxalic acid showed an important decrease in the uptake from 143 mg g^{-1} to 20 mg g^{-1}. The type and concentration of acid used in the chemical modification(0.1 M^{-1} M) is the major parameter affecting the maximum uptake. The carboxylic acids having more than one –COOH lead to cross-linking effect and so to decrease in g max. Langmuir-Freundlich isotherm model fitted better the isotherm adsorption data for modified and unmodified algae. Pseudo second order model was well in line with the experimental data. The adsorption rate constant(K2) is higher for modified algae with acetic acid than that of raw algae. The maximum uptake is independent of isotherm adsorption temperature in the studied range. (39 Ref.; 2 Tab.; 5 Fig.).

49.15029

Ultrasonic studies on molecular interaction of α–amino acids in aqueous solutions at different *p*H. KANNAPPAN (V), CHIDAMBARA VINAYAGAM (S), (Post Graduate and Research Department of Chemistry, Presidency College(Autonomous), KamarajSalai, Chepauk, Chennai-600 005, India). (Indian J. Pure Appl. Phys.; 51, 7; 2013, Jul.; 471-8).

Describes a novel method that involves ultrasonic velocity measurement and has been adopted for the accurate determination of iso-electric point(pI) of eleven α–amino acids at 303 K. The β–amino acids used as aspartic acid(Asp), glutamic acid(Glu), asparagine(Asn), phenylalanine(Phe), threonine(Thr), glycine(Gly), alanine(Ala), valine(Val), isoleucine(Ile), proline(Pro) and hislidine(His). Allied acoustical compressibility(β), acoustical impedance(z), free length(L_f), relative adiabatic compressibility("β/β_o) apparent molal compressibility ($Ø_K$) available volume(V_a) are computed for aqueous solutions of these amino acids at different *p*H values. Conductance has been measured for aqueous solutions of these amino acids at 303 K at different *p*H values and pI values are evaluated from the *p*H value at which minimum conductance was observed. Compared the pI values determined by ultrasonic and conductivity methods with those obtained by electrometric method. It is found to be good agreement between the values obtained by different methods. (23 Ref.; 2 Tab.; 16 Fig.).

49.15030

Effect of glucose and nitrogen source of caffeine degradation by four filamentous fungi. PAI (PV), PAI (A), PAI (S), DEVADIGA (SY), NAYAK (V), VAMAN RAO (C), (Department of Biotechnology Engineering, NMAM Institute of Technology, Nitte-574 110, Karnataka State, India). (Indian J. Biotechnol.; 12, 3; 2013, Jul.; 432-4).

A time bound study is undertaken on caffeine degradation of fungi, viz. *Chrysosporiumkeratinophilum, Gliocladiumresum, Fusarium solani*and*Aspergillus retrictus*, Studied the degradation at 1 g/L concentration of caffeine with 1-8 g/L glucose and with or without nitrogen(NH4Cl) source at 2 g/L in minimal liquid medium by subjecting to shake flask culture at 120 rpm and 30°Centigrade. Analyzed the caffeine degradation up to 7 days at 24 hours interval by high performance liquid chromatography(APLC). It is evident that varying concentration of glucose did not affect the caffeine degradation by all the four test fungi. Over all, *Chrysosporiumkeratinophilum* showed significantly higher rate of caffeine degradation compared to other test fungi, irrespective of presence or absence of nitrogen source in the medium. However, the caffeine degradation by *Chrysosporiumkeratinophilum* was on the higher side in the absence of nitrogen source. In contrast, *Gliocladiumroseum, Fusarium solani*and *Aspergillus restrictus* showed better rate of caffeine degradation in the presence of nitrogen source in the medium. (20 Ref.; 2 Fig.).

49.15031

Effect of non-thermal electrons and warm negative ions on ion-acoustic solitary waves in multi-component drifting plasma. GHOSH (B), BANERJEE (S), PAUL (SN), (Department of Physics, Jadavpur University, Plot No. : 8, Salt Lake Bypass, LB Block, Sector III, Salt Lake City, Kolkata-700 098, India). (Indian J. Pure Appl. Phys.; 51, 7; 2013, Jul.; 488-93).

Investigated the effects of non-thermal electrons and warm negative ions on the conditions for existence and structure of first and second order ion-acoustic solitary waves in a multi-component drafting plasma. The existence, of a critical concentration of negative ions which

decides the existence and nature of ion-acoustic solitary waves, is shown. Found the pro-thermal electrons, the concentration of negative ions and the temperature of negative ions that have significant contributions towards the excitation and structure of the ion-acoustic solitary waves. The plasma under consideration can support the formation of compressive, rarefactive as well as W-type solitons with certain restricted values of plasma parameters. The results are important in the context of ionospheric and magnetospheric plasmas. (30 Ref.; 5 Fig.).

49.15032

Expression pattern of transcription factors during zygotic genome activation in buffalo(*Bubalasbubalis*) embryos produced in vitro. PATEL (AV), SINGH (KP), VARSHNEY (N), CHAUHAN (N), PATLA (P), SINGLA (SK), MANIK (RS), (Animal Biotechnology Center, National Dairy Research Institute(NDRI), Near Jewels Hotel, Grand Trunk Road, Karnool-132 001, Punjab State, India). (Indian J. Biotechnol.; 12, 3; 2013, Jul.; 323-9).

Describes the early embryo which is transcriptionally silent following fertilization and early development is directed by the complement of maternally inherited messenger ribonucleoroacids(mRNAs) and proteins. At some point, however, a maternal to embryonic transition occurs, in which further development is directed by the zygotic transcripts. So, the quantitative expression pattern of high nobility group nucleosome binding protein-2(HMGN-2) and cyclic adenosine monophosphate(cAMP) response element binding protein(CREB) genes involved in transcription activation and two other genes viz. : Euchronic histone lysine methyltransferase (EHMT)-1 and EHMT-2 involved in epigenetic modificationwere evaluated in different embryonic stages with and without different concentration of α–aminitin for determining this transition stage. The results have shown that the mRNA transcripts of EHMT-1, EHMT-2, HMGN-2 and CREB were present in immature, in vitro-matured oocytes and in embryos at 2-, 4-, 8- to 16-cell, morula and blatocyte stages. However, all these four genes showed very low levels around the 8- to 16-cel stage and their levels increased by at least 80% at the blastocyst stage compared to those initially found in immature GV or in vitro matured oocytes, which indicates that the zygotic genome activation occurs at 8-16 cells stage in vitro produced buffalo embryo. (20 Ref.; 2 Tab.; 13 Fig.).

49.15033

Search of an equation of state for nanomaterials. BHATT (A), SHARMA (G), MUNISH KUMAR, (Department of Physics, Govind Ballabh Pant University of Agriculture and Technology, Pant Nagar-263 145, Udham Singh Nagar, District, Uttarakhand State, India). (Indian J. Pure Appl. Phys.; 51, 9; 2013, Sep.; 642-50).

An effort is made to search a suitable equation of state(EOS) model for the nanomaterials. Six EOS models based on different physical origins viz. :Brich-Murnaghan model, Murnaghan model, Kumar model, Vinel model, Freund and Ignalls model and Tallon model are used to study the compression behavior of thirtyone nanomaterials. Compared the results with the available experimental data. It is concluded that Murnaghan model performs well for the

materials considered for the pressure ranges considered in the experimental studies of these materials. Discussed the Murnaghanmodel, that may be obtained using different concepts. (36 Ref.; 2 Tab.; 27 Fig.).

49.15034

Molecular weights and tanning properties of tannin fractions from *Acacia mangium*bark. TENG (B), GONG (Y), WUYONG (C), (Key Laboratory for Leather Chemistry Engineering of the Education Ministry and National Engineering Laboratory for Clean Technology of Leather Manufacture, Sichuan University, Wangjiang Campus, Section No. : 24 of Southern Yichuan, Chengdu 610065, Sichuan Province, China). (J. Soc. Leather Technol. Chem.; 97, 5; 2013, Sep.-Oct.; 220-4).

The comminuted bark of *Acacia mangium*was extracted with acetone solution and the extract was then degreased with petroleum ether. The degreased solution was extracted by diethyl ether and ethyl acetate successfully. In this way, divided the tannin of *Acacia mangium*into the diethyl ether fraction, the ethyl acetate fraction and the water fraction, respectively. Measured the tannin molecular weight of these fractions by gel permeation chromatography (GPC) and examined the particle sizes of tannin by a Zetasizer(ZS) instrument. The results showed that the ether fraction consisted of the smallest molecules with an average molecular weight of 415Da possessing weak tanning ability but having a fast penetration rate. The molecular weight of the water fraction was 1788Da which showed significant tanning ability. The molecular weight of the water fraction was 2808Da with better tanning ability and the biggest particle size was shown by this tannin. The thermal stability of the hide powder and cowhide tanned by these tannins was follows : water fraction>ethyl acetate fraction>diethyl ether fraction; ethyl acetate fraction>water fraction. These results could provide a valuable reference for the use of the *Acacia mangium* tannin. (16 Ref.; 3 Tab.; 5 Fig.).

49.15035

Industrial biotechnology-Status and future trend.KIRCHER (M), (M/s. Evonik Industries AG, RellinghauserStrasse 1-11, 45128 Essen, Germany). (Chem. Ind. Dig.; 26, 9; 2013, Sep.; 55-61).

Industrial biotechnology is a real cross-sectorial technology providing a common basis to energy carriers, bulk, specialty and fine chemicals, as well as pharmaceuticals. So far generally limited to natural biochemical, today even products not known to nature come into the reach of the citizens through modern synthetic biotechnology. In addition to the product oriented toolset, industrial biotechnology is key to exploit a broad range of carbon sources from sugar, through lignocellulose, to syngas and CO, thus connecting so far not related industries and building unusual value chains. Discusses the status and future trends in industrial biotechnology in the chemical industry. (14 Ref.; 2 Tab.; 3 Fig.).

49.15036

Glycerol-A "sweet" option for value addition. CHAKRABARTI (PP), (Center for Lipid Research, Council of Scientific and Industrial Research-Indian Institute of Chemical Technology(CSIR-

IICT), Uppal Road, Tarnaka, Hyderabad-500 007, Telengana State, India). (Chem. Ind. Res.; 26, 9; 2013, Sep.; 77-80).

There is a glut of glycerol today due to the search for alternate fuels like biodiesel. Thankfully, glycerol affords the potential of being a platform chemical, as a starting material for several other chemicals. Glycerol has higher functionality and can be converted to many chemicals with the two primary and one secondary hydroxyl groups. Reactions can proceed in different pathways resulting in complex mixtures of products. Optimization of reaction conditions and development of suitable catalysts for producing the desirable product is of immense importance and involves intense research. Elaborates some of the important recent achievements. (5 Ref.; 1 Fig.).

49.15037

Production of biodiesel from natural sources. DEY (M), (Leather Technology Department, Government College of Engineering and Leather Technology, Block-LB, Sector-III, Salt Lake City, Kolkata-700 098, India). (J. Indian Leather Technol. Assoc.; 63, 9; 2013, Sep.; 988-92).

Our society is highly dependent on petroleum for its activities. However, petroleum is a finite source and causes several environmental problems such as rising carbon dioxide levels in the atmosphere. About 90% is used as an energy source for transportation, heat and electricity generation, being the remaining sources used as feedstocks in the chemical industry. As demands for energy are increasing and fuels are limited, research is directed towards alternative renewable fuels. (5 Ref.; 1 Tab.; 1 Photo).

49.15038

Strategies to overcome India's energy crisis. PANICKER (PKN), VENKATARAMAN (NS), (Chemical Industries Association(CIA), Indian Society for Technical Education(ISTE), Professional Center Room No. : 4, 1st Floor, Behind Engineering College, Adjacent to Kotturpuram Police Station, Gandhi Mandapam Road, Guindy, Chennai-600 025, India). (Chem. Wkly.; 59, 6; 2013, Sep., 17; 217-8).

Indicates that the Chemical Industries Association, an apex body representing a cross-section of chemical industries recommends the measures, such as short-term measures, medium term measures namely (a) the promotion of Jatropha biofuel as substitute for diesel; (b) solar power project-the need for polycrystalline silicon production and (c) promotion of algae biofuel as substitute for petroleum fuel; developments of offshore wind power projects, for the consideration of Government of India and state governments, on the bases of the careful deliberations. Suggests the options such as the formation of hydroelectric power and the creations of the projects like shale gas and coal bed methane. But they are shortlisted as they create numerous problems such as huge land costs, acquisition and delays. The projects have a variety of environmental and ground water issues that are yet to be considered in depth and sorted out and they appear to be uncertain at present in Indian conditions. It is

very firmly expected from both the Central and State governments that dedicated research and development facilities to further optimize the production of jatropha and algae-based biofuels, as well as solar power and offshore wind energy have to be initiated in extreme urgency for which the governments have to initiate appropriate programme and policy and introduce them immediately. (2 Photos).

49.15039

A review of available and emerging technologies for the production of sustainable natural gas via gasification of biomass.DOMENICHINI (R), MANCUSO (L), RUGGERI (F), PALONEN (J), (Power Division, M/s. Foster Wheeler ItalianaS.r.l.; Via Sebastiano Caboto 15, Corsico, Milan 20094, Italy).(Chem. Ind. Dig.; 26, 9; 2013, Sep.; 46-52).

Biomass gasification can provide an economically viable system for producing gaseous biofuels. This route can benefit from all advantages of natural gas, that is, in addition to a well-established infrastructure in many parts of the world, it can be used as an alternative fuel in the transportation sector and allow power plants to meet very high efficiency targets. Furthermore there are countries that import natural gas, while having a great domestic availability of biomass. Aims, mainly for an investigation of the biomass gasification for the co-production of power and substitute natural gas (SNG), which can be distributed by using the existing electricity and natural gas grid infrastructures, respectively. Presents the Foster Wheeler's fluidized-bed gasification technology and its methane technology(the WESTA process). Describes the process chain necessary for the thermo-chemical production of SNG from biomass.Identified the different alternatives for the main involved technologies, steps such as tar removal processes, syngas conditioning and cleaning, with the main goal of designing a performing and reliable plant, based on the use of industrial and recognized technologies. (7 Ref.; 4 Tab.; 6 Fig.).

49.15040

Non-linear propagation of electrostatic waves in relativistic Fermi plasma with arbitrary temperature. CHANDRA (S), GHOSH (B), (Department of Physics, Jadavpur University, No. : 188 Raja Subodh Chandra Road, AurobindoBhawan, Kolkata-700 032, India). (Indian J. Pure Appl. Phys.; 51, 9; 2013, Sep.; 627-33).

Investigated the modulational instability of electron plasma waves using the quantum hydrodynamic (QHD) model for quantum plasma at finite temperature by deriving a non-linear Schrödinger equation including relativistic effects. Shown the electron degeneracy parameter and streaming velocity that significantly affect the linear and non-linear properties of electron plasma waves in a finite temperature quantum plasma. (24 Ref.; 9 Fig.).

49.15041

Separation techniques of close boiling point substances. JOY (B), SREELEKSHMI (RV), (Agro-processing and Natural Products Division, Council of Scientific and Industrial Research-

National Institute of Interdisciplinary Science and Technology(CSIR-BIIST), Industrial Estate P.O., Pappanancode, Thiruvananthapuram-695 019, Kerala State, India). (Chem. Ind. Dig.; 26, 9; 2013, Sep.; 67-70).

Separations of substances, with close boiling points, are tedious. But modern techniques in practice have made the job a little less difficult. Distillation, a technique produced since ancient times, is a physical method to separate volatile liquids. These liquids are separated using different types of distillation. Heat sensitive liquids are separated by steam distillation. Fractional distillation is mainly engaged in separating liquids which have close boiling points or differ by 25°Centigrade. Since deterpenation of pepper and ginger oil was ineffective by fractional distillation and solvent partition, the deterpenation of pepper and ginger oil by column chromatography is tried and achieved. An effort has been made to summarize the various separation techniques and studies carried out till date with the support of a case study on the 'Terpeneless pepper and ginger oil'. (15 Ref.; 6 Tab.).

49.15042

Go green strategies & their applications to polymers & additives-Part-1 : Polymers. RANGAPRASAD (R), (South Indian Education Society(SIES)'s School of Packaging, Packaging Technology Center, Sri ChandrasekarendraSaraswathyVidyapuram, Plot No. : 1C, Sector V, Nerul, Navi Mumbai-400 706, Maharashtra State, India). (Chem. Wkly.; 59, 5; 2013, Sep., 10; 205-11).

The world is becoming increasingly sensitive to the growing scarcity and the possible drying of petroleum-the source of virtually all plastics. In this context, many countries have embarked upon study of replacement of oil-based products by bio-sourced equivalent or innovative products. (2 Fig.; 3 Photos).

49.15043

Go green strategies & their applications to polymers & additives-Part 2 : Bio-additives. RANGAPRASAD (R), (South Indian Education Society(SIES)'s School of Packaging-Packaging Technology Center, Sri ChandrasekarendraSaraswatiVidyapuram, Plot No. : 1C, Sector V, Nerul, Navi Mumbai-400 706, India). (Chem. Wkly.; 59, 7; 2013, Sep., 24; 189-93).

Bio-additives can be differentiated on the basis of the degree of modification of the used natural products. The additives, that have been mainly derived from products coming from natural sources such as fatty acid salts and esters, use of building bricks from natural products to build new chemical structures; use of biopolymers as biocarbon content enhancers in fossil plastics as well as direct use of natural additives namely natural fibers, cashewnut shell liquid. Biomass needs more or less complex treatments before use and a list of those treatments, has been given. The workhorse additives, that are in use for a very long time and the result is that it is always an essential interest in carrying out the continuous research efforts. Discusses the natural phenol and amine derivatives that possess antioxidant properties. Discusses in detail also about the bioplastics, that act as the biocarbon content

enhancers for fossil plastics and the development, of specific or general purpose bio-platforms and bio-blocks. (3 Tab.; 1 Fig.; 1 Photo).

FINISHING MATERIALS

49.15044

Powdered hide model for vegetable tanning-Part II :hydrolyzable tannin. BROWN (EM), TAYLOR (MM), BUMANLAG (L), (United States Department of Agriculture(USDA), Agricultural Research Service(ARS), Eastern Regional Research Center, No. : 600 East Mermaid Lane, Wyndmoor, Pennsylvania 19038, USA). (J. Am. Leather Chem. Assoc.; 110, 1; 2015, Jan.; 19-22).

Vegetable tannages employ both condensed and hydrolysable tannins. The interactions of the condensed tannin, quebracho, with powdered hide had been earlier reported as part of the authors' exploration of the tanning mechanisms. The interactions of chestnut extract called a hydrolysable tannin, with powdered hide samples are reported and compared with those of the condensed tannin. Hydrothermal stability of powdered hide treated with the hydrolysable tannin reached a maximum of 75°Centigrade at a 40% offer, compared with 84°Centigrade for a similar offer of condensed tannin. The hydrolyzable tannin was much more effective at improving collagenase resistance, with nearly complete protection at <10% offer. (17 Ref.; 1 Tab.; 3 Fig.).

49.15045

Analysis of pore-size and related parameters for leather matrix through capillary flow porosimetry technique. SIVAKUMAR (V), JENA (A), GUPTA (K), MANDAL (AB), (Chemical Engineering Division, Council of Scientific and Industrial Research-Central Leather Research Institute (CSIR-CLRI), Adyar, Chennai-600 020, India). (J. Soc. Leather Technol. Chem.; 99, 1; 2015, Jan.-Feb.; 16-22).

Leather processing involves diffusion of various chemicals through the pores of skin/leather matrix. Pore-size of the matrix has significant impact on the diffusion rates of the involved substances. The determination of pore-sizes and related parameters is necessary for an understanding of the diffusion phenomena in leather processing and related techniques. There are some limitations in existing pore-size measurement techniques for natural fibrous materials like leather; hence there is a need for development of novel techniques with non-influencing character on structure of materials like leather. In this regard, a capillary flow porosimetry technique for pore-size measurement has been applied to two types of leather viz. : full-chrome crust leather(FCC) and vegetable-tanned crust(VTC). Important pore-size parameters such as smallest, largest and mean pore-size plus porosity and average Darcy permeability have been determined by utilizing the capillary flow porosimetry technique.The respective values are 0.04μ, 0.93μ, .13μ, 59.1% and 0.027 respectively for FCC leather and 0.04μ, 0.67μ, 0.11μ, 49.9% and 0.021 for VTC leathers. The results indicate that FCC leather has greater porosity compared to VTC leather; possibly due to chrome tanning providing less filling effect compared to vegetable tanning. (23 Ref.; 2Tab.; 14 Fig.).

49.15046

Color in leather finishing. SERGI (LIMy), ROCA (R), (Tecnica& Color, S.L. Artana, Cami la Mina S/N 12527 Artana, Castellón, Spain). (Aqeic Bol. Tecn.; 66, 1; 2015; 5).(Spanish).

States that several words like dyeing, pigmenting, coloring, adjusting hues etc. have been widely used in finishing leather to get the color and appearance of the desired finish, with coverage, transparency, fashion, intensity etc.-that makes them, commercially interesting and technically strong.Discusses that how products used for these purposes, that is, dyes and pigments have been modified over the years. Speaks on how fashion, fastnesses, European regulations have changed the presentation of dyes and pigments and even more explains the changes suffered by these compounds to make them more environmentally friendly, with better resistances and better colorful performances.

49.15047

Color forming property of derivatives and modification products of natural iridoids with methylamine. SHAO (X), DING (K), LIU (J), (College of Chemistry & Environmental Protection . . . . . th of the Southern First Loop, Wuhou District, Chengdu 610041, Sichuan Province, People's Republic of China). (J. Am. Leather Chem. Assoc.; 110, 1; 2015, Jan.; 1-12).

The color-forming properties of methylamine with natural iridoids such as genipin, swertiamarinaglycone and methylswertimarinaglycone had been studied previously. Studies the derivatives of geniposide, swertiamarin and gentiopicroside were obtained via hydrolysis or replacement of glucose by a methoxy group. Modification products of genipin, loganin andmorroniside were achieved by introducing an additional substituent group to their backbone. The compounds before and after derivatization or modification were reacted with methylamine, so that insoluble pigments would be produced and their color-forming properties could be investigated; the relation between the color and structure of the compounds was explored. (9 Ref.; 2 Tab.; 14 Fig.).

49.15048

Synthesis and application of eco-friendly amino resins for retanning of leather under different conditions. RASHID (S), AHMAD (A), FAHIM (AQ), (Department of Chemistry, Government College(GC) University, Near Nasir Bagh, Katchery Road, Lahore 54000, Pakistan). (J. Soc. Leather Technol. Chem.; 99, 1; 2015, Jan.-Feb.; 8-15).

Synthetic tanning agents are indispensable for making any type of leather article. There is a challenge for syntans to be processed without formaldehyde to meet strict regulations in the leather goods and chemicals arena. Describes the development of formaldehyde-free melamine-based retanning by using glyoxal as a condensing agent and sodium sulfamate as a sulfonating agent. Sulfonated glyoxylated melamine-based resins were prepared using

different mole ratios of melamine, sodium sulfamate and glyoxal. The sodium sulfamate to melamine mole ratio(SS/M) was varied from 0.5 to 3.0 and glyoxal to melamine ratio(G/M) was varied from 2 to 6. Evaluated the fluidity and gelling behavior of resinous solutions with the increasing trend of sulfonation and with increasing mole ratio of glyoal to melamine. Stabilized resins were applied comparatively as retanning agents on chrome-tanned goatskins against a conventional formaldehyde based melamine resin. Comparative tear strengths, tensile strengths, elongation at break and scanning electron micrographs(SEM) of glyoxylated melamine and studied the formaldehyde-based melamine-retanned leathers as well as found the better performance in glyoxylated melamine-tanned leathers. The resin with optimum performance was structurally elucidated by fourier transform infrared(FTIR). (42 Ref.; 3 Tab.; 6 Fig.; 4 Schemes).

49.15049

Biotech opens new routes for isoprene production. (Chem. Wkly.; 60, 22; 2015, Jan., 6; 216-8).

Isoprene(2-methyl-1,3-butadiene) is an important commodity chemical with annual demand of over a million tonnes. Styrene-isoprene-styrene is the second largest application of isoprene and it is mainly used as a thermoplastic rubber and in pressure-sensitive thermosetting adhesives. Over the years, many process technologies have been investigated. Summarized these process technologies.

49.15050

Protective nano coating. NANEX, (Leather Int'l; 416, 4846; 2014, Nov./Dec.; 29).

Disclosed the information, that has been obtained during the firm's product development for leathers as a manufacturer is specializing in nano coating. (1 Photo).

SPECIAL PURPOSE LEATHERS

49.15051

Cool glove leathers made using thermo responsive syntans. JAYA PRAKASH (A), RAGUL (M), RAGHAVA RAO (J), NISHAD FATHIMA (N), (Chemical Laboratory, Council of Scientific and Industrial Research-Central Leather Research Institute(CSIR-CLRI), Adyar, Chennai-600 020, India). (J. Am. Leather Chem. Assoc.; 109, 12; 2014, Dec.; 411-7).

Protection is the main function of gloves and also comfort of the wearer has to be kept in mind while making gloves without compromising on strength and flexibility. Body dissipates heat in the form of sweat; sweating through hands is likely to be more while using gloves in relatively hot weather conditions resulting in discomfort and slipperiness. Stresses a need, for development of materials, which can respond to temperature changes providing comfort and protection in order to overcome these problems. Encapsulated the Phase Changing

Material(PCM) in condensate polymers of melamine formaldehyde for preparation of thermo responsive syntan. The syntan was characterized using different techniques such as Differential Scanning Calorimetry (DSC), Thermo Gravimetric Analysis(TGA) and Scanning Electron Microscopy(SEM). Glove leathers made using this syntan were termed "Cool glove leathers" as they showed thermo responsive behavior, which exhibited a temperature difference of 1.5±0.5°Centigrade to that of control leather samples with 0.5±0.4°Centigrade. The cool glove leathers were tested for various properties like strength, organoleptic and thermo responsive function. (23 Ref.; 4 Tab.; 13 Fig.).

49.15052

A touch of class. BANKS (J), (Leather Int'l; 217, 4847; 2015, Jan./Feb.; 24-6).

It is very strongly pointed out that the finest-quality materials are essential when it comes to luxury aircraft interiors and attention-to-detail service. Leather is a key component in achieving the right look and feel are communicating the right brand values. Indicates the reasons behind why leather is always holding the upper-class. (4 Photos).

49.15053

Tanning technique of *Crocodylus* Bag leather. QIANG (T), GAO (X), CHEN (Y), WANG (X), (College of Resources and Environment, Shaanxi University of Science and Technology, University Zone of Wei Yang District, Shaanxi Research Institute of Agricultural Products Processing Technology, University Zone of Wei Yang District, Xi'an, Shaanxi 71000, China). (J. Soc. Leather Technol. Chem.; 99, 6; 2014, Nov.-Dec.; 273-9).

Discusses in detail about the operation points and considerations of each process in beamhouse, tanning and finishing operations on the basis of the structural features of*Crocodylusinfoticus* raw hides. Methods like multi-step degreasing, strong lining, oxidation-reduction bleaching were used to solve the problems in *Crocodylusniloticus*tanning, such as high fat content, cuticle cleaning, color non-uniformity etc. Devised the processing technology which can be applied to practical production of *Crocodylusniloticus* leather. The finishing leather was full, soft and resilient, with high shrinkage temperature, uniform color, through the application of this technology thus meeting the requirements for bag leather. (9 Ref.; 1 Tab.; 9 Fig.).

49.15054

Sky high.HUDSON (A), (M/s. SGS, No. : 1 Place des Alpes, P.O. Box 2152, No. : 1211 Geneva 1, Switzerland). (Leather Int'l; 216, 4846; 2014, Nov./Dec.; 23-5).

Looks at the way, in which the airlines continue to record ever increasing passenger numbers and how the industry has seen major consolidations and buy-outs. Game-changing innovations in plane designs have ensured that the need for product differentiation continues to be critical and leather play an important role in these developments as the age of the

plane is gradually changing in the favor of the current passengers. It has been very simple and inexpensive to get to almost any destination worldwide as unlike this in the past years. (1 Tab.; 2 Photos).

LEATHER PROPERTIES. QUALITY CONTROL

49.15055

Characterization of goat leather structure using a metallographic technique. ZHANG (H), LU (H), ZAN (Y), XI (Y), LI (T), (School of Chemical and Material Engineering, Jiangnan University, No.: 1800 Lihu Avenue, Wuxi 214122, Jiangsu Province, China and Shandong Provincial Key Laboratory of Fine Chemicals, Qilu University of Technology, No. : 58 Jiofang East Road, Lixia 250353, Jinan Province, China). (J. Soc. Leather Technol. Chem.; 99, 1; 2015, Jan.-Feb.; 23-9).

Examined first a series of cross sections of the goat bluestock using a metallographic technique with a scanning electron microscopy (SEM) in the back-scattered electrons (BSEs) mode and an optical microscope with oblique illumination. Illustrated in detail about the different patterns of leather structure through analyzing and comparing the images obtained in different modes.Explained the advantages and disadvantages of various examination methods.(12 Ref.; 22 Fig.).

49.15056

The relationship between water vapor permeability and softness for leathers produced in Poland. ŚMIECHOWSKI (K), ŻARŁOK (J), KOWALSKA (M), (Faculty of Materials Science, Technology and Design, Kazimierz Pulaski University of Technology and Humanities, JackaMalczewskiego 29, Radom, Poland). (J. Soc. Leather Technol. Chem.; 98, 6; 2014, Nov.-Dec.; 259-63).

Discusses the testing of selected properties of leather produced in Poland particularly properties which are important for comfort. Tested the shoe leathers mainly for water vapor permeability and softness. Water vapor permeability tests were performed according to the new method which uses equipment made by the M/s. Radway Company and which enables fast measurement in conditions similar to those under which the leather is used. In total, a range made by 8 Polish tanneries were tested. The results of this study showed that the majority of selections of leather produced in Poland is of very good quality. The water vapor permeability of the leathers ranged from 380 mg/10 cm^2/24 hours to 4930 mg/10 cm^2/24 hours(according to the method of UTH Radom). Investigated the relationship between softness and water vapor permeability.(21 Ref.; 2 Tab.; 8 Fig.).

BY-PRODUCTS

49.15057

Preparation and characterization of collagen grafted by styrene-butyl acrylate and its application for pure sizing. ZHANG (S), WANG (Q), DOU (W), WANG (X), QIANG (T), (College

of Light Industry and Energy, Shaanxi University of Science and Technology, No. : 6 Xuefu Road, Weiyang District, Xi'an, Shaanxi Province, Key Laboratory of Paper Making Technology and Specialty Paper, Xi'an, Shaanxi Province, China 710021). (J. Am. Leather Chem. Assoc.; 109, 12; 2014, Dec.; 404-10).

Collagen extracted from tannery wastes was modified by grafting it with modular chains formed by polymerizing vinyl and acrylate monomers. Tested the novel collagen product obtained in this manner as paper sizing agent. The structure and properties of modified collagen were characterized by fourier transform infrared(FTIR), Simultaneous Thermal Analysis(STA) and X-Ray diffraction(XRD). Results indicate that polyvinyl chains were grafted onto collagen, primarily in its crystalline regions. This modification significantly improved the thermal stability of collagen. Then the modified collagen emulsion alone(MCE), or combined either with gelatinized starch(MCE+S) or commercially produced styrene-acrylic emulsion(MCE+SAE), was applied to the surface of corrugating medium. Compared the properties of these products with those of commercially produced medium sized by SAE+S. Sizing by MCE+S increased the ring crush index by 12.7% and tensile index by 13.4%. In a $Cobb_{60}$ test the corrugating medium sized by a blend of modified collagen and styrene acrylic emulsion (MCE+SAE) absorbed less water than commercially produced medium sized by SAE+S. (29 Ref.; 2 Tab.; 8 Fig.).

49.15058

Microbial keratinase and its potential application in the management of tanning hair waste. ONYUKA (AS), BATES (M), COVINGTON (AD), ANTUINES (APM), (Institute for Creative Leather Technologies, Park Campus, The University of Northampton, Boughton Green Road, Northampton NN2 7AL, Northamptonshire, England). (J. Am. Leather Chem. Assoc.; 109, 12; 2014, Dec.; 425-30).

Up to 40 tons of solid hair waste can be generated during the industrial leather manufacturing process posing disposal problems. Composting is considered a viable technology to recycle the hair waste for application in agriculture. However, due to its constituent protein, keratin hair is remarkably resistant to degradation under natural conditions. The keratin degrading bacteria is isolated and their ability to degrade hair as a preliminary study towards developing a biocatalyst to improve hair degradation during composting is evaluated. Subsequently, a keratinolytic microorganism also was isolated from a nutrient alkaline culture(*p*H 11) with bovine hair as the source of carbon and nitrogen. The microorganism, identified as belonging to the *Bacillus* species grew optionally in the temperature range of 40-50°Centigrade. The partially purified microbial keratinase exhibited broad substrate specially at *p*H range 7.5-10. The *p*H and temperature of optimum activity was determined at 9.0 and 50°Centigrade, respectively. Scanning electron microscopy(SEM), assessment of the hair samples showed complete fragmentation of the structure after incubation with the microbial keratinase. Hence, the microbial keratinase has greater potential application as inoculant to enhance biodegradation of tannery solid hair waste during the composting process. (24 Ref.; 11 Fig.).

49.15059

Energy production by microbial fuel cell. BHATT (YV), GANATRA (VJ), (Shri Bhaghubhai Mafatlal Polytechnic, Opposite Cooper Hospital, IrlaJuhu Road, Vile Parle West, Mumbai-400 056, India). (Chem. Wkly.; 59, 5; 2013, Sep., 10; 213-5).

Demonstrates the effectiveness of the microbial liquid-microbial fuel cells(ML-MFCs)'s performance for the treatment of wastewater with chemical oxygen demand(COD) and biological oxygen demand(BOD) removal about 90%. Observes the increase in current and voltage production with decrease in distance between the electrodes, reducing the substrate diffusion limitations. (3 Tab.; 4 Fig.).

49.15060

Use of silk hydrolysate in chrome tanning.ASLAN (GI), GULUMSER (G), OCAK (B), ASLAN (A), (Faculty of Engineering, Department of Leather Engineering Ege University, Erzene, GenclikCaddesi 35040 Bornova/Izmir, Turkey). (J. Soc. Leather Technol. Chem.; 98, 5; 2014, Sep.-Oct.; 193-8).

Examined the characteristics and experimental load of sheep skins that had been treated with silk hydrolysate by two different methods namely (a) prior to tannage and (b) after tannage. Silk hydrolysate was applied to the leathers before and after tanning in four different proportions. The chrome oxide content and shrinkage temperature, tensile strength and tear load of the leathers increased as the proportion of silk hydrolysate increased and the highest levels of chrome exhaustion in the tanning effluents were obtained at an application level of 5% on the basis of leather weight. In addition, silk hydrolysate was found to improve wastewater parameters such as chemical oxygen demand (COD), total suspended solids(TSS), total dissolved solids(TDS), salinity and electrical conductivity(EC). (35 Ref.; 4 Tab.).

49.15061

Elucidation of probable mechanism for biocidal resistance in skin-borne *Bacillus subtilis*. KAVITHA (S), SWARNAKUMARI (B), CHANDRA BABU (NK), VAHINI (M), VANDHANA (C), (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, 12; 2014, Dec.; 418-24).

Attempts, to determine the probable mechanism, through which a skin borne bacterium *Bacillus subtilis*, might develop resistance against a dithiocarbamate based biocide. Studied the changes occurring in the cell wall constituents and morphology in the cells grown at sub-optimal level concentrations of biocide, based on which the probable mechanism of buildup of biocidal resistance has been proposed. There has been considerable change/ reduction in cell wall constituents, peptidoglycan, diaminopimelic acid and teichoic acid due to the presence of biocides. The cell wall permeability has also been found to be reduced

by propidium iodide staining technique. Proposed the morphology of the cells as studied using scanning electron microscopy(SEM) reveals that there is shortening of rod shape of the cells due to the action of the biocide. The skin-borne *Bacillus subtilis*, encountered in leather processing that might develop resistance through changes in the cell wall constituents and reduction in the cell wall permeability, based on the results of this study. (34 Ref.; 9 Fig.).

49.15062

Agricultural wastes : Technologies for effective utilization of rice & wheat stubble. VERMA (SS), (Department of Physics, Saint Longowal Institute of Engineering and Technology (SLIET), Campus Road, Longowal-148 106, Sangrur District, Punjab State, India). (Chem. Wkly.; 60, 18; 2014, Dec., 9; 191-4).

Discusses that the mind-set of the people involved in agriculture in Punjab or Haryana is similar and burning of stubble is taken as the easiest and most cost-effective alternative. The States can innovate in terms of either old or new technologies for using rice straw and invite private players to set up facilities locally to put stubble to better use. Any idea that does not provide a mechanism for transporting rice straw from the fields to the industrial units are sure to face failure, even if it utilizes effective technology. The method must provide added value to farmers so that they stop burning rice straw in their fields in order for it to work. (5 Photos).

49.15063

Utilization of agricultural by-products to partially replace gelatin in preparation of products for leather. TAYLOR (MM), BUMANLAG (LP), LEE (J), LATONA (NP), BROWN (EM), LIU (CK), (United States Department of Agriculture(USDA), Agricultural Research Service(ARS), Eastern Regional Research Center(ERRC), No. : 600 East Mermaid Lane, Wyndmoor, Pennsylvania 19038, USA). (J. Am. Leather Chem. Assoc.; 110, 1; 2015, Jan.; 13-8).

Discusses that the subjective properties of the leather were seen when polyphenolic–modified gelatin-products were used as fillers. No significant changes were not seen in the mechanical properties when the treated samples were compared. Costs are increasing and there is an urgent need to find a substitute that could be combined with the gelatin, thereby partially replacing and reducing the amount of goal required as the gelatin is in short supply at the present time, with the goal that the new products would retain the desired characteristics of gelatin products. Evaluates the potential, of producing biopolymers from the reaction of polyphenols with gelatin in combination with other proteins(e.g. whey) or with carbohydrates(e.g. chitosan and pectin). The feasibility, of these reactions, have been recently demonstrated by several researchers. These combinations would take advantage of the distinct properties of both species and at the same time, create products with improved functional properties. Recently, investigated the preparation of polyphenolic-modified gelatin/whey biopolymer products and the results of product characterization using physicochemical analysis indicated optimal products that could be used as fillers. These

products, that had been applied to wet white, that was then finished and evaluated the subjective and mechanical properties. At the same time, a method was developed to determine the rate of uptake of the product properties. These findings could further add to the knowledge of using renewable resources in production of unique products that may have leather processing application. (23 Ref.; 14 Fig.).

WOOL TECHNOLOGY

49.15064

Application and properties of modified wool Keratin composites as film-forming agent for leather processing. ZENG (C), QI (L), (Key Laboratory of Modification and Functional Fiber of Tianjin, Research Institute of Biological and Spinning Materials, Tianjin Polytechnic University, No. : 63 Chenglin Road, Hedong District, Tianjin-300160, People's Republic of China and Engineering College of Northeast Dianli University, No. : 169 Changchun Road, Jilin City-132022, Jilin Province, People's Republic of China). (J. Soc. Leather Technol. Chem.; 98, 6; 2014, Nov.-Dec.; 269-74).

Describes a series of wool keratin/hydroxymethyl cellulose sodium(CMCNa)/glyoxal composite membranes which were prepared via solution blending and cross linking modification technology. Critically investigated the optimization of composite films preparation via orthogonal experimental design. Experimental results indicated that the cross-linking agent had a greater effect on the mechanical properties of films. The composite membrane showed good tensile strength and maximum elongation, under the optimal condition(keratin/CMCNa weight ratio : 5.5, 0.3% glyoxal, reaction time : 1 hour, reaction temperature : 37°Centigrade) which can be used as a film-forming agent in leather finishing. Moreover, in contrast to casein, the application properties of the leather finished by modified keratin composite film were measured as tensile strength increased by 11.3%, elongation at break improved by 25.7% as well as water vapor, permeability by 3.76% and wet rub resistance fastness improved from 3 to 4. However, air permeability decreased by 15.1% Scanning Electron Microscopy(SEM) and fourier transform infrared(FTIR) analysis verified that it has good compatibility, strong hydrogen bonds and covalent bonds formed between cross-linking agent and raw material molecules. The product might be great potential for application in leather finishing as film-forming agent instead of casein. (27 Ref.; 2 Tab.; 4 Fig.).

TANNERY. ENVIRONMENTAL ASPECTS

49.15065

Three decades since Bhopal, 1984 : Reflections on chemical process safety. RAJAGOPAL (R), (M/s. "Chemical Weekly", Corporate Office, No. 602, 6th Floor, 'B' Wing, Godrej Coliseum, Behind Everard Nagar, Off. Eastern Express Highway, K.J. Somaiya Hospital Road, Sion (East), Mumbai-400 022, India). (Chem. Wkly.; 60, 21; 2014, Dec., 30; 197-201).

Inherently safer design(ISD), rational design, process intensification (PI) and other approaches in designing safer chemical processes have led to significant progress in risk management in the chemical industry. Emphasizes the need, for newer models to design and manage chemical process safety programmes. Discussed the strategies, in planning inherently safer chemical operations in the chemical and downstream industry. (7 Ref.; 3 Photos).

49.15066

The influence of research of leather ecological properties on its products-Eco-design. CHEN (J), CHENG (B), SUN (S), ZHANG (X), (Tianjin University of Science and Technology, Zidong Road, Binhai, Tianjin 300457, People's Republic of China). (J. Soc. Leather Technol. Chem.; 98, 6; 2014, Nov.-Dec.; 275-84).

Discusses that the ecodesign for leather products implies that the different potential environmental impacts of the main material, leather and finished products must be taken into account considering the whole life cycle, apart from the general design criteria(i.e. technical, functional, aesthetic or economic). A bag made of leather was taken as a case study in this paper. A sustainability assessment of the methodology, given the major concern on carbon footprint(CF) and environmental risk assessment(ERA), were combined to derive complementary criteria for the ecodesign of leather products. Thus analyzed the effect of ecological properties of leather on finished products. It was concluded that the key to leather product ecodesign is to choose leather. Leather's ecological properties directly determine their values of CF and ERA. It was shown that, the process, Clean-energy usage and the waste disposal have impacts on CF. Different countries and processes resulted in great gaps in leather's CF. Banned azo colorants have the most carcinogenic risk amongst the hazardous compounds used in the leather industry. Thus, the leather is crucial in the process of ecodesign for leather products, the ecological criteria and supplier selection are rigorous. The perspective provided by the indicators of different nature was balanced to accomplish fair evaluation on the premise of aesthetic design. Produced the selection of leather under sustainable criteria and recommended the reduction of the materials consumption, since the area requirements would be minimized and the absence of hazardous compounds would ensure safety conditions during the use stage. (24 Ref.; 7 Tab.; 2 Fig.).

49.15067

Environmental challenges & technical development in Asian leather sector. RAJAMANI (S), (Asian International Union of Environment(AIUE) Commission, Old No. : 18, New No. : 45, First Street, South Beach Avenue, MRC Nagar, Chennai-600 028, India). (Leather News India; 6, 1; 2015, Jan.; 59-62).

Deals with the recent development in the world leather sector with special reference to Asian countries. (6 Ref.; 6 Fig.).

49.15068

Tackling automotive emissions : Compact catalylic converter system removes gaseous pollutants as well as particulates. (Chem. Wkly.; 60, 23; 2015, Jan., 13; 199-201).

It is seen that the official emission standards are becoming more and more restrictive worldwide. It is stated that the compliance with these standards will require further optimizing of the catalytic converter. Describes a promising new technology for this purpose, which is the new four-way conversion catalyst that has been developed by M/s. BASF. (3 Photos).

LEATHER PRODUCTS

FOOTWEAR

49.15069

Common cause. (World Footwear; 28, 6; 2014, Nov./Dec.; 14-5).

Discusses that the best practice, which if collected is sure to lead for harmonization across the industry as the varying audit standards and codes of conduct can lead to confusion at factory level. (1 Photo).

49.15070

Integrated polyurethane footwear. STÖBENER (K), DORMANN (B), DESMA (K), (Schuhmanschinen GmbH, Desmanstrasse 3-5, 28832 Achim, Germany). (World Footwear; 28, 6; 2014, Nov./Dec.; 16-9).

Describes the current drawbacks of producing footwear, fresh approach of integrated design using polyurethanes, the process of shoe production, economics and also the potential of producing footwear. (4 Fig.; 1 Photo).

49.15071

'Greener' PUCFs. (World Footwear; 28, 6; 2014, Nov./Dec.; 28-9).

It is found that synthetic upper materials particularly polyurethane coated fabrics(PUCFs) have been started to be used in every huge proportions as the use of the leather for shoe production turns to be very huge expensive. China occupies the prime position in the uses of PUCFs. It is realized that while PUCF uppers might not be as comfortable to wear as those made from leather, they are not harmful to the wearer. They are, however, considered to be so to people employed in the manufacture of the material itself and to the environment in general. Stated the reasons for these facts. (1 Photo).

49.15072

If looks could sell. ACHARYA (DK), (M/s. "Council of Leather Exports, Western Region, STAR HUB, Building No. : 1, Unit No. : 102, 1st Floor, Near Hotel Hyatt Regency & ITC Maratha, Sahar International Airport Road, Andheri(East), Mumbai-400 099, India). (Leather News India; 5, 12; 2014, Dec.; 86-9).

Glances at three categories namely style, fashions and fads that can be seen in cases of the special categories of product life style. Discusses briefly about each and every one of these categories and also the influence of fashion on footwear. Discusses additionally about the various factors, that very much influence the fashion on footwear such as elements of fashion, shapes, design, materials, color, ornamentation and treatment as well as an "ideal" form for a product, which is to be sought, remains a significant goal for both designs and marketing management. (3 Photos).

49.15073

Shoes for senior citizens. (World Footwear; 28, 6; 2014, Nov./Dec.; 20-3).

Discusses the necessity of also examining the general physiological changes that occur over time in order to fully understand the changes ofwalking by the people when they grow up with special reference to the older persons and also the benefits they generally obtain with the changes in the sizes and models of shoes for themselves for fully understanding these changes in locomotion. The general physiological capacities obviously decrease with age but, exactly due to various other factors. A large part of the answer is due to overall changes that take place in the body during the ageing process. (1 Fig.; 4 Photos).

49.15074

Who's to blame? (World Footwear; 28, 6; 2014, Nov./Dec.; 25-6).

Describes a harrowing fact which is realized through a survey that 62% of the people were unaware that shoes were available in different width fittings. It is realized also that the customers would only need to establish that correct size once and then be able to buy shoes from any outlet in the confidence they would fit sufficiently well to prevent discomfort and avoid permanent damage. Perhaps the blame for badly fitting shoes does after partly lie with the industry as well as consumers. Asked a question on whether another look should have to be made on this existing fact. (1 Photo).

49.15075

Better bootshave carbon footprint. GORE (WL), (World Footwear; 28, 6; 2014, Nov./Dec.; 38).

Discusses the calculation of the extent, to which high quality hiking boots help people to keep their carbon footprint as low as possible as consumers become increasingly keen on knowing the environmental profile of all the productsthey buy. (2 Photos).

LEATHERGOODS

49.15076

Up in the air. SETTER (S), (Leather Int'l; 216, 4846; 2014, Nov./Dec.; 18-20).

Looked into the information, which is needed for the author and method of securing the same on leather seat covers in aircraft and finds out just what the aviation sector means to the leather industry although initially grounded by the aviation industry's lack of cooperation. (3 Photos).

SUBJECT INDEX

AUTHOR INDEX

NIRMALA (S)	49.15020
NISHAD FATHIMA (N)	49.15051
OCAK (B)	49.15060
ONYUKA (AS)	49.15058
PAI (A)	49.15030
PAI (PV)	49.15030
PAI (S)	49.15030
PAL (VKSN)	49.15010
PALONEN (J)	49.15039
PANICKER (PKN)	49.15038
PATEL (AV)	49.15032
PATLA (P)	49.15032
PAUL (SN)	49.15031
PERUFFO (A)	49.15012
PERUMAL (GPL)	49.15019
PRABHAKAR (S)	49.15022
PRASADA PRABHU (N)	49.15022
QI (L)	49.15064
QIANG (T)	49.15053
	49.15057
QIN (J)	49.15025
RAGHAVA RAO (J)	49.15018
	49.15051
RAGUL (M)	49.15051
RAJAGOPAL (R)	49.15065
RAJAMANI (S)	49.15067
RAMESH (R)	49.15014
RANGAPRASAD (R)	49.15042
	49.15043
RANJITHKUMAR (A)	49.15014
RASHID (S)	49.15048
RATTA (B)	49.15027
RAVI KUMAR (G)	49.15027
ROCA (R)	49.15046
ROSE (C)	49.15014
RUGGERI (F)	49.15039
SAHOO (AP)	49.15028
SENTHIL KUMAR	49.15019
SERGI (LIMy)	49.15046
SETTER (S)	49.15076
SHARMA (BS)	49.15026
SHARMA (G)	49.15033
SHARMA (SK)	49.15010
	49.15026
SHAO (X)	49.15047
SINGH (KP)	49.15032
SINGLA (SK)	49.15032
SIVAKUMAR (V)	49.15045
SIVVASWAMY (SN)	49.15020
SMIECHOWSKI (K)	49.15056
SOTHMANN (S)	49.15004
SREELEKSHMI (RV)	49.15041
SRINIVAS (R)	49.15022
STÖBENER (K)	49.15070
SUDESH KUMAR	49.15027
SUN (S)	49.15066
SUYAMBUKESAN (S)	49.15019
SWARNAKUMARI (B)	49.15061
TANNAN (K)	49.15009
TAYLOR (MM)	49.15044
	49.15063
TENG (B)	49.15034
TIWARI (AK)	49.15027
TIWARI (S)	49.15027
TOMKIN (M)	49.15003
VAHINI (M)	49.15061
VAMAN RAO (C)	49.15030
VANDHANA (C)	49.15061
VARSHNEY (N)	49.15033
VEER SINGH (L)	49.15027
VENKATARAMAN (NS)	49.15038
VERMA (SS)	49.15062
WAGNER (C)	49.15013
WANG (Q)	49.15057
WANG (T)	49.15025
WANG (X)	49.15053
	49.15057
WU (L)	49.15016
WUYONG (C)	49.15034
XIA (Y)	49.15055
YANG (W)	49.15021
YAPICI (BM)	49.15015
YIN (Z)	49.15016
YUKO (N)	49.15002
ZAN (Y)	49.15055
ZARLOK (J)	49.15056
ZHANG (H)	49.15055
ZHANG (S)	49.15057
ZHANG (X)	49.15066
ZENG (C)	49.15064
ZHOU (L)	49.15021

-: J I L T A :-

Owner: Indian Leather Technologists' Association, ***Printer***: Mr. S. D. Set, ***Publisher***: Mr. S. D. Set, ***Published From***: 'Sanjoy Bhavan', (3rd floor), 44, Shanti Pally, Kasba, Kolkata - 700107, West Bengal, India *AND* ***Printed From***: M/s TAS Associate, 11, Priya Nath Dey Lane, Kolkata-700036, West Bengal, India, ***Editor:*** Dr. Goutam Mukherjee.