



6th International Symposium on Fuels and Lubricants



Highlights of 11th March, 2008

PANEL DISCUSSION – ENERGY EFFICIENT LONG DRAIN LUBRICANTS

The first panel discussion of ISFL-2008 on Energy Efficient Long Drain Lubricants was chaired by Shri. R.A. Rao, Advisor IAL and Dr. S.P. Srivastava Consultant. The panelists included Shri M. Kumbhani, Lubrizol India Private Limited, Shri N Rajan, Wartsila India, Dr. Eric W Schneider General Motors R&D, Shri A. Chatterjee and Dr. K.P. Naithani both of Indian Oil Corporation Limited. Shri Kumbhani spoke on the global scenario on advancements in lubricant additive technology. He highlighted the importance of fuel economy, CO₂ emissions, durability in passenger cars and heavy duty diesel vehicles. He expressed the view that while there is no industry wide heavy duty engine oil specification, achieving the right balance between durability and drain interval will be the key driving force for the new engine oil development. A holistic approach in balancing fuel economy, oil drain interval, emissions and durability will be essential for sustainability.

Shri N Rajan of Wartsila presented details of gas engines and lubricant considerations for such engines in marine and related applications. He described the technology trends particularly in 4-stroke gas engines (turbocharging, lean burn etc.) and the importance of optimum ash content of lube oil for valve train wear control. He mentioned that low emissions, lower oil consumption, higher power output, lower maintenance cost etc. will be the main factors for future development of gas engines and their lubricants.

Dr. Eric W. Schneider in his talk discussed various



Seated on the dais (from left to right) Shri A. Chatterjee, ED, IndianOil, Shri N. Rajan, GM (TS), Wartsila, India Dr. S.P. Srivastava, Consultant, Shri R.A. Rao, Advisor IAL; Shri M. Kumbhani, Lubrizol India; Dr. Eric W. Schneider, General Motors R&D, and Dr. K. P. Naithani, GM, IndianOil.

initiatives taken by General Motors in collaboration with additive manufacturers and oil companies, in their efforts in extending service life of engine oils. He expressed optimism about new developments using additives and nanotechnology and is of the view that there is a limit to achieving fuel economy through low viscosity oils as it would lead to reduction in engine

durability. General Motors is currently working on development of a new standard engine test method (Sequence VID) for fuel economy measurement.

Shri A. Chatterjee in his talk provided an overall picture of issues related to Indian lubricant business. He expressed concern over the diversity of lubricant



Shri M. Kumbhani, Lubrizol India

industry practices and base oils being used from different sources. He also highlighted importance of introduction of high performance lubricants like long life turbine oils, compressor oils, hydraulic oils etc.

Dr. K.P. Naithani highlighted trends in grease technology related to thickener types, additives etc. The key issue facing the grease industry is the worldwide shortage of lithium hydroxide and hence there is an urgent need for development of alternate thickener to lithium soap greases. Low noise greases, wind mill greases with long life, food grade greases, bio-degradable greases, greases based on nano materials like carbon fibers are the emerging requirements for grease manufacturers. Use of additive packages in grease making and development of genuine grease concepts have also set in.



Shri N. Rajan, GM, Wartsila India



Dr. Eric W. Schneider, General Motors



Shri A. Chatterjee, ED, IndianOil



Dr. K. P. Naithani, GM, IndianOil

Plenary Session-II : New Generation Lubricants



Seated on the dais (from left to right) Prof. S. K. Biswas, IISC Bangalore, Shri N.R. Raje, Director, Alternate Energy Centre, UP&ES, Shri G.S. Ramachandran, MD, IAL, Mr. Owen Wyrley Birch, Lubrizol, Singapore

India - A destination of choice for design and manufacture of automobiles

The 2nd plenary session of ISFL-2008 on New Generation Lubricants was held on March 11, 2008.

There were three presentations. Mr. Owen Wyrley Birch of Lubrizol International Singapore, made a thought provoking lecture on evolving trends and their effects on sustainable development in automotive sector. Picking up the threads from

ISFL-2006, he elaborated on topics like changing vehicle population, fuel change etc. He also highlighted the challenges in lubrication technology vis-a-vis emission control norms, fuel economy targets and durability under various operating conditions and fuel composition. Mr. Owen highlighted the Indian Scenario where vehicle population has doubled in the last eight years and India has become a destination of choice for design and manufacture of automobiles.

Prof. S.K. Biswas of Indian institute of Science, Bangalore, presented a study on Boundary Lubrication of Oil-in-Water Emulsion. His presentation included the basic fundamentals of the role of water, oil and emulsifier additives (PEG mono-oleate) using advanced techniques like Atomic Force Microscope (AFM). Prof. Biswas discussed in detail oil-water-additive interactions and the chemical changes taking place on the steel surfaces and then studied their friction properties in the form of pull of forces by using an AFM. Such fundamental studies can lead to development of new generation lubricants for metal working applications.

Prof. Biswas also made a presentation on "Nano Tribology and Nano Additives" on behalf of Prof. Hugh A Spikes of Imperial College, London. The presentation covered emerging technologies on nano scale studies using advanced techniques e.g AFM, Surface Force Apparatus (SFA). The potential of fullerene as an additive for achieving low friction between moving components was also highlighted.



Prof. S. K. Biswas, delivering his lecture



Mr. Owen Wyrley Birch, delivering his lecture

Nano additive in fuel and over based detergents based on CaCO₃ nano particles are the two prime areas of current interest in nano tribology.



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Swami Sukhabodhananda Ji Addresses ISFL Delegates



Swami Sukhabodhanandaji, the renowned spiritual guru addressed the august gathering on the topic "Sustainable Development Through Self Management". Swamiji who is the founder chairman of Prasanna trust mesmerised the audience with his inspiring address.

Swamiji's book 'Oh, Life Relax Please', has set an all time sales record. Swamiji advocates a unique self development programme with a rich blend of Eastern and Western approaches.

Technical Sessions Highlights

High Quality Base Stocks for Modern Applications by Dr. Jean P. Andre of ExxonMobil Research and Engineering Company, U.S.A. gave a review of process options, applications and performance considerations for producing high quality base stocks for modern applications.

In his keynote paper "Advances in refining catalysts, Mr. Carel Pouwels of Albemarle Catalysts Company BV spoke of catalyst design for maximum propylene in resid FCC. Large variety of feedstocks is available for processing in the refining industry.

While the different technology platforms Topaz and Jade provide top notch solutions for resid applications, Albemarle has developed breakthrough technologies to help the refiner process heavier feedstocks. Solutions are given for units that require unprecedented coke selectivity and

metals resistance. Also novel technologies are presented that enhance bottom conversion and crack deeper into the bottom of the barrel.

For the maximization of propylene from resid, Albemarle has developed a catalyst technology applied in AFX catalyst. This technology minimizes hydrogen transfer, while maintaining catalyst activity and slurry conversion in heavy resid applications.

The paper "High Efficiency Photoelectrochemical Hydrogen Generation Using Hybridized Nanotubular Arrays of TiO₂ as Photo anode and Cathode" by Dr. Sushant Mohapatra of Metallurgical and Materials Engineering, USA reported construction of a novel photo electrochemical cell for generation of hydrogen using solar light. Band gap modified ordered arrays of TiO₂ nanotubes act as a photo anode. The conventional flag type platinum sheet

cathode is replaced with TiO₂ nanotubes loaded with Pt nano-particles. Both the formation of ordered nanotubes and modification of the band gap are achieved by a single step electrochemical anodization process in fluoride containing organic solutions (typically ethylene glycol) and subsequent annealing in hydrogen environment. The anodization of Ti foil in organic solutions results in incorporation of carbonaceous species at the walls of the nanotubes and subsequent heat treatment causes diffusion of carbon into TiO₂ lattice, which modifies the band gap to 2.1 eV. The nanotubular TiO₂ photo anodes formed by the anodization process show more superior charge transport properties and structural integrity than the anodes made of nano-particles. Further, construction of very large area (active on both sides) electrode materials with uniform electronic and mechanical properties is easily achievable using the proposed electrochemical anodization process.



Dr. Jean P. Andre delivering keynote paper



Dr. Carol Pouwels delivering keynote paper



Dr. Sushant Mohapatra delivering keynote paper

Cultural Evening and Felicitation at Tivoli Garden



NAME OF EXHIBITORS

ALLIANCE TECHNOLOGIES
LABINDIA INSTRUMENTS PVT. LTD.
LABCON SCIENTIFIC INSTRUMENTS (P) LTD.
PID ENG & TECH - SPAIN

JV SCIENTIFIC INSTRUMENTS PVT. LTD.
ELICO MARKETING PVT. LTD.
INDIAN OIL CORPORATION LTD.
ACE INSTRUMENTS - SARBI ENGG.

TRIBOTECH TECHNOLOGIES PVT. LTD.
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