Oleochemicals gaining prominence in speciality Chemicals

Increase in demand for bio-degradable products and sustainable solutions coupled with changes in regulations in recent times are increasing the influence of oleochemicals in various segments of chemical industry. The global oleochemicals market is likely to reach 18 MnTonnes by 2018. Recent advances have created new applications in various segments such as in polymers, lubricants and biosurfactants which offer significant opportunities for companies in the long run. Chemical companies which explore organic and inorganic growth options in this space could be poised for major growth, say Manish Panchal, Charu Kapoor and Binay Agrawal of Tata Strategic Management Group.
Traditionally, oleochemicals have been used for applications such as surfactants, personal care, soaps and detergents and food additives. However, various new applications of oleochemicals such as biolubricants, biopolymers, and biosurfactants are emerging as replacements of petroleum based products creating exciting growth opportunities.

The global oleochemicals market in FY13 was estimated at 14 Mn Tonnes and is expected to grow at 6% p.a. over the next five years. Asia Pacific accounts for 68% of the global oleochemicals market and is expected to grow at 8% p.a. over the next five years. Surfactants, home care and personal care are the largest end use segments for oleochemicals.

Demand for sustainable solutions, biodegradable products, and REACH (Registration, Evaluation, Authorisation and Restriction of Chemical substances) like regulations are major growth drivers for oleochemicals based products and are hence driving innovation in this area. Customers increasingly prefer products based on natural sources and this trend is likely to become more prominent across geographies in future.

Chemical companies are also increasingly committing to sustainable development as part of responsible care initiatives which are further driving requirements for such products, e.g. Solvay wants to increase its share of raw material through bio-sources from 11% in 2010 to 20% in 2020.

Combination of these growth drivers have resulted in emergence of new products and applications based on oleochemicals and one of the major beneficiary of the same is Plastics, e.g. Polyamide, an engineering plastic, is now made from castor oil with available and proven technology. Similarly, Polyols, which are inputs for polyurethane, are being increasingly made through oleochemicals route with technologies and processes refined over the years.

Chemical companies focusing on lubricants, polymers, and surfactants can explore diversifying their product portfolio based on oleochemicals. The biggest advantage with such diversification is that companies not only continue to serve their core businesses but also significantly lower their portfolio risk and their carbon footprint.

Petroleum based lubricants have been leading the industry since decades. However, these do not readily degrade and therefore pose an environmental hazard. Once used, their disposal becomes a challenge, the cost of properly disposing such material is high and improper disposal can create several health and environmental hazards. This presents a strong incentive to produce lubricants which are bio-degradable. Currently lubricants market is estimated at 38 MnTons out of which bio-lubricants account for ~3% share (1.2 MnTons). Conservative estimates reveal that the global lubricant market is expected to reach approximately 45 MnTonnes by 2020 out of which bio-lubricant will account for ~9% (4 MnTons) of the market. Some companies have already spotted this opportunity and working towards building a biolubricant based product portfolio e.g. Cargill has developed an electrical insulation fluid based fully on soybean oil.

Like biolubricants, biopolymers are substituting traditional petrochemicals based polymers due to their better bio-degradability. The market for bio-polymers is in its infancy and estimated at ~1.3 MnTonnes globally in 2012 as compared to the global polymer demand of ~180 Mn Tonnes. It is expected to grow at a
rate of 40% annually to reach ~20 MnTonnes by 2020 accounting for 7% of the global polymer market. This rapid penetration of bio-polymers offers growth opportunity for companies. MNC’s such as BASF, Solvay, DuPont, DSM and Lanxess as well as few small companies like EarthSoul and Harita have spotted this opportunity and are working towards building polymers based on vegetable oils.

**New Age surfactants (MES, Non Ionics)**

Methyl Ether Sulfonate (MES) is an oleochemical based substitute for Linear Alkyl Benzene Sulfonate (LABS). Till now, the development of MES has been hindered by the lack of installed production capacity but interest in this space is becoming more intense due to benefits of MES, which scores better than LABS on multiple counts. MES has excellent characteristics such as high purity and active level, and is devoid of any volatile organic compound (VOC). It is also gentle on the skin, has low percent of di-salt, is white/near white in color, and is suitable for both liquid and powder detergents.

In 2011, Jiangsu Haiqing Biotechnology setup a 100,000 Tonnes / year MES plant in China which is the largest plant of MES to go on stream. Going ahead, such activities are further expected to drive growth of MES and it will potentially start replacing LABS at a rapid pace. The current LABS global market is estimated at ~3 MnTons and MES constitutes less than 1% of the same. It is expected that by 2020 MES will replace one third of LABS demand to reach 1.2 MnTonnes.

**Opportunities exist in Asia**

Asia is not only a major consumer but also a major producer of oleochemicals and related products and today accounts for 68% of the world consumption and 60% of world production of oleochemicals. Malaysia and Indonesia are major producers of base oleochemicals such as fatty acids and fatty alcohols and have attracted investments from almost all major global companies such as Emery Oleo, Wilmar, BASF etc.

This scenario has dramatically changed in recent years. Just over two decades ago, ~90% of all oleochemicals and derivatives were produced in developed countries such as USA, Europe and Japan. Today the majority of installed capacities are in Asia and new capacities are also being added in this region. Large captive consumption and availability of key raw materials such as palm oil and palm kernel oil has been a key reason behind the industry’s shift to Asia.

This shift to Asia led to capacity overhang in base oleochemicals over the past years. To curtail it and to ride over reduced profitability, large plantation companies in Asia such as IOI Chemicals have invested in downstream processing of their feedstocks. Many plantation companies have also created partnerships with chemical companies over the last three years leading to further strengthening of Asia as a major hub for oleochemicals and downstream products.

**Imperatives for Chemical Companies**

Oleochemicals based products provide significant diversification opportunity for chemical companies. Various levers including partnerships, acquisitions, and organic growth can be used to establish a presence in this segment.

**Strategic Partnerships** : Opportunities exist for entry in any part of the oleochemicals value chain (Figure 2). A joint venture option can be explored with a technology provider for setting up an oleochemical derivatives manufacturing unit close to customers. This will help meet the unique needs of speciality chemicals customers.

**Exploiting local feedstock availability** : In Asia, countries such as Indonesia and Malaysia are rich in palm oil and palm kernel oil whereas India is the third largest producer of high erucic rapeseed oil and the world’s largest producer of castor oil. Chemical companies can explore the business of oleochemicals and its derivatives related to these feedstocks. Companies can explore manufacturing of value added (downstream) products or position themselves to cater to the entire value chain.

**New Applications** : Companies with strong R & D capabilities can also explore building a successful business in oleochemicals by introducing new molecules. For example, a country to country initiative and company to company initiative can be undertaken for joint research in oleochemicals. Indian companies have already taken this initiative in agrochemi-
cals and have been quite successful. This can be replicated in oleochemicals to develop new products for global market.

**Challenges**

**Shift to Biodiesel**: Biodiesel (methyl esters of various chain lengths) is one of the uses of oleochemicals (Ref Figure 3). Any change in Govt. regulations and blending norms for biodiesel can significantly impact economics of oleochemicals based products. Increased requirement from biodiesel could push prices of oils higher thereby making them less attractive vis-à-vis petroleum feedstocks. However, this risk is largely mitigated due to a significant shift worldwide towards shale gas as the new and economically viable energy source.

**Feedstock availability**: Continuous availability of feedstocks is a concern which remains at the top of the mind of companies operating in oleochemicals. Historically, about 12% to 14% of the world’s vegetable oil production has been used for oleochemicals production. The emerging applications discussed above would require an additional ~ 8 MnTonnes of vegetable oil by 2020. Estimates show that this can be met with the increasing global vegetable oil production which is projected to increase from 150 MnTonnes in 2012 to 185 MnTonnes by 2020.

Besides the above, companies are fast realizing that there are other geographies around the world which offer climatic conditions suitable for palm oil plantations. Sierra Leone and Liberia form a major part of what is called the new frontier for palm oil production in West Africa. For example, Golden Veroleum plans to invest up to $1.6 billion in Sierra Leone and is eyeing over half a million hectares of land for palm plantations.

**Way Ahead**

Oleochemicals based products offer a significant diversification opportunity for chemical companies. Asia is the preferred geography with a growing market and availability of feedstock.

To capitalize on this opportunity, companies can explore partnerships / mergers with base oleochemicals companies or think about integrating forward / backward themselves. Going further, companies can also plan to establish their footprint in new geographies which could provide them a first mover advantage and position them as a strong integrated player.

Industries such as lubricants, polymers and surfactants are likely to be impacted with replacement products based on oleochemicals and companies which capture major portion of the value chain or spot trends early could benefit significantly in the long run.

**References**

- Tata Strategic chemicals database
- Various articles and industry reports
- Vision 2020 – The Palm Oil Phenomenon
- Primary interaction with industry experts

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Chemical
The Chemical Practice at Tata Strategic has an in-depth understanding of Chemicals sector and has experience in developing growth strategies for several clients in the Chemicals and Fine Chemicals space. It has also assisted large corporates and MNCs with India entry strategy, business due-diligence, M&A, go-to market strategy, operational improvement and cost benchmarking exercises.

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