2. RECENT TRENDS IN OLEOCHEMICALS

Oleochemicals refer to chemicals derived from natural oils and fats of both plant and animal origins. Basically, oleochemicals refer to the fatty acids and glycerol derived from the splitting of the triglyceride structures of oils and fats. However, they also include those derivatives derived from the subsequent modification of the carboxylic acid group of the fatty acids by chemical or biological means, and other compounds obtained from further reactions of these derivatives. Oleochemicals are often categorised into basic oleochemicals such as fatty acids, fatty methyl esters, fatty alcohols, fatty amines and glycerol, and their further downstream derivatives obtained from further chemical modifications of these basic oleochemicals. Oleochemicals are starting to replace crude oil derived products in various applications. Stearic acid is replacing paraffin wax in candle making, meanwhile natural fatty alcohol replacing synthetics. The relentless climb of palm oil production and the recent high crude oil price encourage significant growth of Indonesian basic oleochemicals. In the early 20th century, the commercial production of fatty alcohol was derived from direct sodium hydrogenation of sperm oil from whales.

The fatty alcohol producers then switched their starting raw materials to tallow, lard, coconut oil, palm kernel oil, and castor oil. Since the mid 1950s, catalytic hydrogenation to produce fatty alcohol from natural fats and oils was proved to be more economical and replaced metallic sodium.
hydrogenation. It is plausible to produce fatty alcohol from direct catalytic hydrogenation of triglycerides. However, the catalyst and hydrogen consumptions are higher because by-product glycerin will be simultaneously hydrogenated to produce propylene glycols and propanol. Moreover, glycerin and glycerides were found to be poisonous to the hydrogenation catalyst. The current practice of fatty alcohol production begins with separating the glycerin from fatty acid/methyl ester before hydrogenate the fatty acid/methyl ester further to fatty alcohol. As widely practiced in petrochemical industry, catalysts also play a very important role in the production of basic oleochemicals. The invention and development of highly selective catalysts often improve the economic competitiveness of basic oleochemicals and thus enhance their widespread use.

The larger amounts of oils and fats are transformed by chemical reaction into basic fatty materials for use in important oil-based industries. Many oleochemicals are manufactured starting with fatty acids and the most important being: (i) nitrogen derivatives, (ii) esters, (iii) metallic soaps, (iv) alcohols, (v) dimeric acids, (vi) ozonolysis products such as pelargonic and azelaic acids. In the world today nitrogen derivatives and esters are the two most important classes of derivatives consuming more than 50 % of fatty acids.
References

