

## Petroleum Feed Stock for Present Needs and Future Challenges

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### Editorial

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### Editorial

Petroleum and petroleum derived products are inseparable part in human life. The variety of petroleum products ranges from cosmetic to industrial chemicals. Hence it is impossible to sustain the human life without the petroleum products. The oil rich countries generally work to compete with each other to produce and export the crude without doing much on any advancement on petroleum value added environment friendly products. Petroleum is the key feed stock for automobile, aviation, and thermal power industries etc. These are also the main source for generating carbon dioxide (CO<sub>2</sub>) which is an undesirable greenhouse gases. There are several global agencies to control CO<sub>2</sub> emission and there are imposed international protocols to proven down the production of oil. Though this is not going to help much in the advancement of petrochemical industries, we need to think alternate technology for producing petroleum derived products without harming the environment. We cannot stop the use of oil and gas in energy sector till we perfect the technology for continuous supply of renewable energy on large scale. No doubt that oil well dry out one day and hence the renewable energy in future is important. However the available source of petroleum can be judiciously used for helping the human race for many vital purposes other than energy industries. We should strictly improve the production of petroleum feed stock by using novel technology for enhanced oil recovery (EOR). We must realize that the most modern materials for future requirements are based on carbon. For example carbon nanomaterials, carbon fiber and many novel carbon materials are attempted by researchers to produce through the use of carbon precursor derived from petro chemicals.

Today we cannot eliminate the use of aluminum in our day to day life even though plastic materials can replace it to a limited extent only. Aluminum cannot be produced without using huge amount of graphite electrodes which is usually manufactured on large scale using petroleum coke. Plastic derived modern materials are in great demand in automobile, aviation, building, computer/mobile industries and for daily needs of numerous domestic uses. Hence it is mandatory for us to continuously and efficiently extract petroleum crude from mother earth and use it for long time without harming the environment. We may realize that fertilizer is essential for sustainable food production. But its supply depends on hydro carbon feed stock for hydrogen production. Though much of the CO<sub>2</sub> produced in ammonia synthesis can be used for urea production, it is not possible to completely use all CO<sub>2</sub> and hence the fertilizer industries should it fix it or vent it after chemical treatment in scrubber /absorber. In recent times CO<sub>2</sub> is used extensively for super critical fluid extraction of many natural products, minerals and even for enhanced oil recovery (EOR). Super critical fluid extraction of oil, though being tried in few places, is not fully explored for optimization in large scale. Of late supercritical CO<sub>2</sub> is used to extract oil spill both from water and soil without affecting the quality of water or nutrients from soil.

Hydrocarbon can be a potential source for energy sector even if alternative renewable technologies are developed/used to eliminate the carbon dioxide emission. Hydrogen is the future energy carrier. Though H<sub>2</sub> can be produced from water, there is a huge amount of energy required for spilt H<sub>2</sub>O. Concentrated solar power (CSP) can help this achievable in the countries where solar energy is available continuously with high irradiance. However hydro carbon can be a potential source for the production of both hydrogen and valuable carbon material on large scale. If a hydrocarbon is cracked, it can

yield both  $H_2$  and solid carbon, yet without  $CO_2$  emission. This technology once developed and commercialized can be a promising source of energy to augment renewable energy in the long run.

Today we see the heavy fluctuation in oil price and this is an unpleasant alarm to oil rich countries whose economy is dependent on exporting oil. Such countries can invest in research for alternate technology to produce value added petroleum products such as  $H_2$  by efficient cracking technique. Human resource for research and development in petroleum industries is slowly declining due to the unstable job market as influenced by the unpredicted oil price. Many young talents nowadays have the tendency to have their education in computers and development of software. This can be stopped by creating many R & D oriented jobs in petroleum industries. Hence many oil producing countries should invest their money to develop new technology which would help the hydrocarbon source for use as the key raw material for sustainable energy. It is advisable now to identify a competing technology for producing hydrocarbon value added products without venting greenhouse gases to environment. This can be resolved only through raised modern education in petroleum and related fields.