

## **THERMOLYSIS OF PLASTIC WASTE- OPPORTUNITIES AND CHALLENGES**

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Plastic waste offers an attractive business opportunity if treated intelligently. Presently, owing to the lack of economically viable recycling solutions and political interest, this valuable feedstock is bound for an ill-fated destiny i.e. landfills and inefficient incineration. Landfilling plastic waste is rather a storage mechanism than a prevention mechanism. Plastics can stay in ground and in oceans for hundreds of years without decomposing, posing serious environmental hazards. Given the complexity of the plastic waste mixture and heterogeneity of waste streams, a single recycling solution is improbable; however, the current environmental situation demands an urgent need to find ways to tackle this ever-growing waste problem.

Thermolysis (pyrolysis) of non-recyclable plastic waste allows the waste to be converted to a valuable hydrocarbon rich petrochemical-based feedstock. This feedstock i.e. composed of oil, wax and gas, has great potential to be used in multiple applications, one of the most attractive ones is co-feeding in a refinery. The gas and char generated in the process can be used to provide the energy needed for thermolysis. Thermolysis of plastic waste has to offer many benefits over other recycling techniques such as the recycling of feedstock contaminated with dirt and organics, recycling of problematic waste such as laminates, multilayer plastic and even hazardous plastics such as those found in electrical or demolition waste. Furthermore, it converts the solid waste that is difficult to store, transport and dispose, into liquid and wax product that is easily transportable. However, like other recycling technologies, it also suffers from some technical challenges, which should be scrutinized before choosing the recycling technology. From the practical aspects, the choice and availability of feedstock, reactor type and investments, use of a catalyst, products needed, availability of standards, REACH, and established markets etc. all these factors come into play and should be evaluated thoroughly. This presentation targets the role of thermolysis in managing global plastic waste. Technological challenges associated with reactor types used for thermolysis and the quality and upgrading of products will be discussed, i.e. comparison of the slow vs. fast thermolysis. Furthermore, the results of a national 'Waste to Products' project will be presented including the learnings from thermolysis experiments.