

RECYCLING & WASTE MANAGEMENT

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Recovery of value added products from post-consumer waste plastics through chemical recycling

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Post-consumer Plastic waste creates severe environmental issues in the eco system during their disposal, due to their inherent non-biodegradable nature. Currently in India nearly 15,500 TPD of waste plastic are generated and nearly 60% of them are collected and mechanically recycled while the remaining 40%, which could not be mechanically recycled, are uncollected and littered and enters in to MSW as land filling. In this aspect, Chemical or Feedstock recycling of waste polymer is particularly beneficial for it is environmentally safe and generates more useful chemicals. Thus development of value added recycling technologies is highly desirable as it would increase the economic incentive to recycle the waste plastics. This paper discusses the pyrolysis of mixed post-consumer waste plastics with various catalysts in a two stage

process involving pyrolysis followed by catalytic cracking. The yields of resultant value added products like Diesel, Gasoline and Aromatics are evaluated under various process conditions. The resultant liquid fuels are characterized for BIS specifications and studied in internal combustion engine for their suitability as the transportation fuel. The gaseous products are analyzed for their chemical composition and energy content. Moreover, the by products like char are also characterized and their uses are also explored. The appropriateness of this process is also evaluated using the frame work of SWOT. Further recommendations and way forward for scale up studies also indicated

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