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Editorial

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Waste management has become one of today's most important challenges to mankind. Earlier days the treated waste were used for (landfill) disposal, storage and in some cases sorted for recycling and reuse. But direct recycling options are limited due to the presence of pollutants like heavy metals and organics (VOC, PAH) in them. Hence the idea of collecting and transforming waste/biomass into valuable materials and energy seems most welcome in this context. Valorisation is a new concept in the field of waste management promoting the principle of sustainable development and this eventually leads to resource efficiency and reduction of environmental damage. Waste valorization deals with treating waste materials and using them as raw material or as an energy carrier, taking care on processes and practices which reduce emissions and related environmental impacts.

In this issue we have listed the articles under four divisions. The first division contains two articles dealing with collection and sorting of waste. Sardot and colleagues (University of Montana, USA) studied about the characterization of plastic waste stream for engineering new second life products. Currently the generated plastic waste is either land-filled or burned. Here the plastic waste was treated and test specimens were made which were subjected to various characterization studies. Bleck and colleagues (Federal Institute for Occupational Safety and Health, Germany) studied how to reduce the occupational risks associated with the informal collection of recyclable materials in Ethiopia. Accepted European risk evaluation methods and expert knowledge were applied to find out the demand for improvements. Working equipment was designed with participation of the collectors. A continuous process of field testing and adjustments led to the final solution.

The second division deals with the conversion of waste to products which enlists four articles. Arcos-Hernandez and colleagues (University of Queensland, Australia) produced polyhydroxyalkanoates (PHA) from biomass sourced from wastewater treatment plants (WWTPs). Singh and colleagues (Indian Institute of Petroleum, Dehradun) succeeded in preparing carboxymethylcellulose, which is an important industrial polymer from corn cobic lignocellulosic waste biomass, and the carboxymethylation reaction was optimized against various parameters to obtain maximum yield. Valverde and colleagues (AIMEN Technology Centre, Spain) focused on the preparation and characterization of heat insulation panels made of waste derived from textile industry (polyester and polyurethane) by thermoforming. Svenson and colleagues (University of Tromsø, Norway) produced low cost, biodegradable protein-based thermoplastic polymers from low value marine waste material from farmed Atlantic salmon.

The third list deals with recycling of an individual type of polymer. Achilias and colleagues (Aristotle University of Thessaloniki, Greece) describe a method for recycling polycarbonate waste using alkaline hydrolysis under microwave irradiation. The results confirm the importance of this recycling method for PC-based waste plastics which helps in monomer recovery and substantial energy saving. The same authors have contributed a review article in recent advances in polycarbonate recycling. In this the authors have described all the available methods for PC

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recycling and their mechanisms and recorded their potentials and weaknesses. Shukla and colleagues (Institute of Chemical Technology, India) studied a very crucial problem—recycling waste PET bottles using aminolytic depolymerization to yield terephthalic dihydrazide (TPDH) which was used to synthesise various benzene derivatives possessing good antibacterial activity. The recycling of polystyrene by selective dissolution technique was studied by Rodríguez and colleagues (University of Castilla-La Mancha, Spain). Abdel-Raouf (Egyptian Petroleum Research Institute, Cairo) also studied the recycling of polystyrene waste by thermal and thermo-chemical methods and compared the results. It was found that the conversion of polystyrene increased in the thermo-chemical process than in thermal process. Massardier and colleagues (IMP/LMM—UMR-CNRS, France) produced new materials from renewable resources mixed with recycled polyamide polymers. The developed end products showed superior properties and exhibited low toxicity. Castro and colleagues (University of Minho, Portugal) present a possible process for treating PVC-containing wastes in an environmentally friendly way by effective de-chlorination through a pyrolysis process at low temperature. The effects of particle size and surface area of cryogenically-ground micronized rubber powders (MRP) on the properties of MRP/polypropylene (PP) composites were investigated by Ayyer and colleagues (Lehigh Technologies, USA). The prepared composites find applications in various market segments, such as automotive, consumer and construction.

The fourth division focuses on the various bio and thermal processes related to valorization. Ye (École des Mines d'Albi, CNRS, France) and colleagues presented a discussion on the recovery of carbon fibres from polymer-matrix composites by the process of steam thermolysis. Onwudili and colleagues (The University of Leeds, UK) recovered carbon fibre and chemical feedstock from waste carbon fibre reinforced plastic (CFRP) sample by catalytic hydrothermal degradation. The recovered fibres showed good mechanical properties. Antil and colleagues (CCS Haryana Agricultural University, India) prepared compost from different organic waste and assessed their maturity and stability by evaluating changes in physical, chemical and biological parameters. Six different composts were prepared and their application significantly increased wheat yield compared with addition of their raw materials. Tabatabaei and colleagues (Agricultural Biotechnology Research Institute of Iran) discussed on biodiesel as a biosolvent for expanded polystyrene (EPS). Different parameters, i.e. flash point density, kinematic viscosity and dynamic viscosity, were evaluated for the waste polymer biodiesel blended diesel fuel which all showed positive results.

All the articles presented here show sincere attempts to protect our ecosystem by effectively converting waste into useful products. Finally, it is very important to add that there is still a long way to go to protect our environment from unwanted waste materials.