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Effect of Silane Coupling Agent on Structural and Mechanical Behaviour of Biomass Ash Reinforced Recycled Polypropylene Composites

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ABSTRACT

This research focuses on reusability and sustainability by developing low cost composites based on recycled polypropylene (PP) matrix and filler biomass ash particles. These lead to change in structural, processability, morphology and physical properties of the raw thermoplastic. Biomass ash (BMA) and automobile polypropylene (APP) are industrial wastes which highly affect the environment. Biomass ash is one of the most inexpensive & low density reinforcement available in large quantities as waste product during gasification process of biomass in thermal power plant and recycled polypropylene is left as scrap in automobile industry. A Proper management and commercial utilization of biomass ashes and automobile polypropylene will provide alternative value added products and also reduction of environmental and economic impacts from the cost of its disposal. APP/ BMA composite were prepared by extrusion followed by injection moulding. Concentration of biomass is varied from 0, 10, 15, 20, to 40% by weight in recycled polypropylene. The performance of filled polymers is determined on the basis of the interface attraction of different concentration and varying particle sizes of the filler. The incorporation of a Silane coupling agent into APP/BMA composite brought about beneficial changes in morphology, rheology and mechanical properties related with improved dispersion of ash particles and increased filler matrix interaction .Recycled polypropylene composite with biomass ash having varied physical & mechanical properties can be used in the commercial usable boards in uses like furniture making office partitions.

Keywords: Composites, Biomass ash, Recycled polypropylene, Silane Coupling Agent, Mechanical Analysis.