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Physicomechanical and thermal properties of betel nut husk nanofiber reinforced polymer composites

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Cellulose extracted from Betel Nut husk fiber was converted to cellulose nanofiber by chemical and mechanical technique to examine their potential for use as reinforcement fiber in biocomposite applications. The cellulose isolated from betel nut husk fiber was subjected to acid hydrolysis using 62% sulfuric acid under ultrasonic treatment. The product was allowed to stand at room temperature to cool and the acid was removed by washing, centrifuged and dialysis with distilled water at room temperature. Betel nut husk fiber was also converted to nanofiber by the milling process. The present work was to investigate the possibility of breaking down the structure to submicron and nanoparticles by high energy planetary ball milling by SFM-1 Desk-Top planetary Ball-Miller, MTI Corporation. Cellulose nanofiber reinforced polymer composites were prepared with different weight percentages (1 wt% to 5 wt%) via casting methods. The tensile, thermal and morphological properties were studied for all composites. Enhancement in the tensile, thermal and morphological properties was shown in the nano-cellulose reinforced composites. Cellulose nanofiber and its reinforced polymer composites were characterized by FTIR, TGA, DSC, Nano Zetasizer, and X-ray diffraction. Its structural morphology was also studied by scanning electron microscope.

Biography

Tanvir Sultana is a PhD student of Bangladesh University of Engineering and Technolog, BUET, Dhaka under the supervision of Professor Md Wahab Khan. She has published 3 papers in the reputed journal. She is a PhD fellow of Bangladesh University Grant Commission (UGC). She is an Assistant Professor of Chemistry of the government college of Bangladesh under Ministry of Education.

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