

Green Synthesis Approach for Renewable Textile Coating and Their Mechanical and Thermal Properties

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Abstract : The extensive use of textile and textile based materials in various applications including industrial applications are increasing regularly due to their interesting properties which require rapid development in their functions to be adapted to these applications [1-3]. Herein, green, new and renewable smart coating was developed for furniture textile fabrics. Facile and single step method was used for synthesis of green coating based on mandarin peel and chitosan. As, the mandarin peel as fruit waste material was dried, grinded and directly dispersed in chitosan solution producing new green coating composite and then coated on textile fabrics. The mass loadings of green mandarin peel powder was varied on 20-70 wt% and optimized. Thermal stability of coated textile fabrics was enhanced and char yield was improved compared to uncoated one. The charring effect of mandarin peel powder coated samples was significantly enhanced anticipating good flame retardancy effect. The tensile strength of the coated textile fabrics was improved achieved 35% improvement compared to uncoated sample. The interaction between the renewable coating and textile was evaluated. The morphology of uncoated and coated textile fabrics was studied using microscopic technique. Additionally, based on thermal properties of mandarin peel powder it could be promising flame retardant for textile fabrics. This study open new avenues for finishing textile fabrics with enhanced thermal, flame retardancy and mechanical properties with cost-effective and renewable green and effective coating

Keywords : flame retardant , Thermal Properties, Textile Coating , Renewable Textile

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