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Thermal Properties of Polyhedral Oligomeric Silsesquioxanes/Polyimide Nanocomposite

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Abstract : In this study, we aimed to synthesize and characterize polyhedral oligomeric silsesquioxanes containing polyimide nanocomposite. Polyimide nanocomposites widely have been used in membranes in fuel cell, solar cell, gas filtration, sensors, aerospace components, printed circuit boards. Firstly, polyamic acid was synthesized and characterized by Fourier Transform Infrared. Then, polyhedral oligomeric silsesquioxanes containing polyimide nanocomposite was prepared with thermal imidization method. The obtained polyimide nanocomposite was characterized by Fourier Transform Infrared, Scanning Electron Microscope, Thermal Gravimetric Analysis and Differential Scanning Calorimetry. Thermal stability of polyimide nanocomposite was evaluated by thermal gravimetric analysis and differential scanning calorimetry. Surface morphology of composite samples was investigated by scanning electron microscope. The obtained results prove that successfully prepared polyhedral oligomeric silsesquioxanes are containing polyimide nanocomposite. The obtained nanocomposite can be used in many industries such as electronics, automotive, aerospace, etc.

Keywords : polyimide, nanocomposite, polyhedral oligomeric silsesquioxanes
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