

عنوان مقاله:

Enhanced Fire Retardancy of poly methyl methacrylate by combination with aluminium hydroxide and magnesium hydroxide

محل انتشار:

اولین کنفرانس ملی نانو از سنتز تا صنعت (سال: 1396)

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خلاصه مقاله:

The use of polymeric materials in life, due to their unique properties such as low weight and easy process, significantly increased. But polymers are relatively high combustibility and most of them produce smoke and toxic and corrosive gases during burning. As a result of modification of the polymer behavior against fire is the main challenge to make them more useful. Retardant additives reduce the risk of fire and release of it. The performance of this class of materials is by increase in combustion time, improve in inflammability of polymer, reduce in heat release rate and prevent of dripping during burning. In this study, it is tried to improve thermal resistance of polymethyl methacrylate PMMA by synthesis and characterization of nanoparticles of magnesium hydroxide and aluminum hydroxide nanoparticles by SEM and XRD and use it as fillers for polymers, which is highly used in Industry. 4 composite samples with ratios of 10/90, 20/80, 30/70 and 40/60 of PMMA and $Mg(OH)_2$ and 4 composite samples with ratios of 5/5/90, 10/10/80, 15/15/70 and 2/20/40 of PMMA and $Mg(OH)_2$ and $Al(OH)_3$ were prepared and their thermal behavior was studied. The results show that increasing the percentage of magnesium hydroxide in the composites, heat resistance of polymer and the melting temperature and the percentage of residual mass in composite increased. The addition of aluminum hydroxide to composite increased the thermal resistance and increased the percentage of residual mass in some of them.

کلمات کلیدی:

Fire Retardancy, Nano Aluminum Hydroxide, polymethyl methacrylate, Nano $Mg(OH)_2$, Nano Composite

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