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Studies on the effect of diatomite on the flammability of ammonium polyphosphate/polypropylene

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Abstract: The flammability of a mixture of (APP/DE)/PP was studied by using both the thermogravimetric analysis and the cone- calorimeter test. In this study the (APP/DG)/PP system was characterized by using the IR spectra, the X-ray diffraction and the morphology of their mixture. The IR spectra indicate that there are incorporate of DE into the APP structure, while X-ray patterns shows that when the percentage of DE equals to 0.4 the system converted to the amorphous state. The SEM of the samples show an interference of the DE particles through the APP units. The analyses of the obtained data from the thermogravimetric and the cone- calorimeter measurements indicate that when mixing DE with APP the flammability of PP was improved. Also, the obtained results indicate that mixing of DE with APP up to 0.6 ratio is the more preferable sample. The mechanisms of the retardant the flammability of PP in presence of APP and DE may due to the formation of phosphoric acid and nitrogen from decomposition of APP and formation of Al and Si oxides from the degradation of DE.

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