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EFFECT OF DIFFERENT ORGANIC SALTS ON THE THERMAL STABILITY OF THE ORGANOCLAYS

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The thermal stability as well as chemical affinity of organically modified layered silicates are determinant for processing and preparation polymer nanocomposites and are believed to play a key role on their properties. Alkyl ammonium based cationic surfactants have been traditionally employed for the organic modification of montmorillonite. However, the thermal degradation of alkyl ammonium modified montmorillonites has been reported to start at temperatures as low as 155°C, which corresponds to the processing temperature range of several industrial thermoplastics. Even though alkyl ammonium intercalating agents have been successfully used as surface treatments for the processing of polymer nanocomposites in the range of 180-200°C, their decomposition is thought to alter the full potential of the material by affecting the clay/polymer interface. However, organoclay degradation as well as the lack of affinity organoclay/polymer upon compounding can limit the extent of intercalation and/or exfoliation in polymer nanocomposites. In order to overcome this limitation, in this work, alkyl phosphonium and alkyl ammonium surfactants were used in different content as intercalating agents for the preparation of thermally stable organophilic clays, and the Argel 35 clay supplied by Bentonit União Nordeste/Campina Grande/Paraíba used in the organic modification. The thermal decomposition of the surfactants and of their organoclays was studied by infrared spectroscopy (FTIR), X-rays diffraction (XRD) and thermogravimetry analysis (TGA). The organoclays based on these surfactants generally present a higher thermal stability than conventional ammonium modified clays, and are believed to be good candidates for preparing nanocomposites using polymeric matrices requiring high processing temperatures, such as polyethylene terephthalate or polyimides.