Pyrolysis Kinetics of Deinking Sludge

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Abstract

Deinking sludge is a solid waste generates from the recycled paper industry. During last decades, disposal of deinking sludges in landfills was a very popular option, however it creates serious environmental problem. To overcome this problem, alternate disposal method can be to utilize deinking sludge for fuel generation through thermo chemical conversion process techniques. In the present work kinetics of deinking sludge pyrolysis have been studied using TGA. The weight loss process of deinking sludge with change of temperature was recorded. The results revealed that the weight loss can be divided into four distinct zones: dewater stage, volatile releasing, burnout carbon and decomposition of some calcium carbonate. These distinct zones can be determined by thermogravimetry analyzer (TGA). The effect of heating rate (10-40 $Kmin^{-1}$) and sample weight (10 mg) of deinking sludge have been determined in the presence of (nitrogen and air) atmosphere having 200 ml/min flow rate. The temperature ranges from (ambient to 900˚C) were used throughout the experiments. The igher activation energy was obtained in oxidizing atmosphere at 20 $Kmin^{-1}$ heating rate then the nitrogen atmosphere.

Keywords: Recycled Paper Sludge * Pyrolysis *Kinetics Parameters *Thermal Degradation