



NON-ISOTHERMAL DECOMPOSITION KINETICS OF POLYANILINE AND ITS DERIVATIVES

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Keywords: Polyaniline, Poly(o-methoxyaniline), Poly(o-ethoxyaniline) and TGA.

Polyaniline (PANI) and its derivatives, i.e. , Poly(o-methoxyaniline) (POMA) and poly(o-ethoxyaniline) (POEA) [1,2] have been intensively studied due to their electrical and optical properties associated with low costs and easy processability [3]. PANI is of great interest due to its environmental stability, low cost of monomer and relatively simple method of synthesis [4]. However, very few studies dealing with the thermal behavior of PANI derivatives, are found in the literature. In this work, the kinetics of thermal decomposition of the conducting form of the polymer, i.e. the emeraldine salt of PANI, POMA and POEA, was studied by means of thermogravimetry (TG) using Ozawa's approach [5,6] to assess the kinetic parameters of the decomposition process. The order of reaction was found to be dependent on the degree of conversion indicating that both the early and the later stages of polymer degradation were next the zero or pseudo zero order kinetics, whereas the intermediate stages follow a first order kinetics. The activation energy was found to be dependent on the degree of conversion and the type of PANI derivative. The activation energy varies from 125 to 145 kJ/mol. Parent PANI presented the best thermal stability and suggesting that thermal stability is influenced by derivatization.

Acknowledgements: The financial support given by LABEX-Embrapa, CNPq, FINEP, CAPES and FAPESP

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