

Thermal Behavior of Solution Polymerized homo- And co-Polyacrylonitriles (homo-PAN and co-PAN))

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ABSTRACT

Homo- and co-polyacrylonitriles (homo-PAN and co-PAN) with the molecular weight above 3×10^5 , polymerized in dimethylsulfoxide (DMSO) or sodiumthiocyanate (NaSCN) solution, were non-isothermally and/or isothermally heat-treated under different environmental atmospheres, i.e. air and nitrogen in a differential scanning calorimeter (DSC).

It has been found that molecular weight and polydispersity of PAN influence little, if any, on the non-isothermal behaviour. However, the existence of molecular structural defects such as keteneimine and enamionitrile were found to lower the maximum oxidation temperature. For the isothermal heat-treatment, the molecular weight of PAN showed a dependence on the time for the maximum oxidation

The effects of environmental gas and the comonomer content on the thermal behavior have also been discussed in relation to the characteristics of PANs.