

Thermal Degradation of Poly(Vinyl Chloride)/Polystyrene Blends in the Presence of Derivatives of Hura Crepitans Seed Oil

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Abstract

Thermal degradation of Poly(vinylchloride)/polystyrene (PVC/PS) blends in the presence of metal soap derivatives of Hura crepitans seed oil was investigated in air and under nitrogen. The kinetics of dehydrochlorination of PVC in PVC/PS blends, 95/5, and 90/10 ratios, under nitrogen in the temperature range, 170-190°C showed stabilization of the polymer by PS with rates in the order, 10-2%min⁻¹ and activation energy, 50.7kJ mol⁻¹. At 190°C, the rate of dehydrochlorination of PVC under nitrogen was reduced by 20.8% for the 95/5 blend. In the presence of metal soaps there was marked reduction in the stability of PVC by PS. From FTIR and DSC analyses, miscibility of the blends was enhanced by the soaps, yielding single T_g of 98.2 and 96.2°C for 95/5 and 90/10 blends respectively. The enhanced stability of PVC in the blends and reduced stability of the polymer in the presence of metal soaps were confirmed by thermogravimetry.

Keywords: thermal degradation, poly(vinylchloride)/polystyrene) blend, Hura oil derivatives, kinetics, thermogravimetry.

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Biography:

Dr. Biotidara Olusesan Frank has been the Director, College Central Research Laboratory, Yaba College of Technology (a multi-disciplinary Laboratory) since its establishment in 2014. He was educated at Sheffield University, Sheffield UK and later at Federal University of Agriculture, Abeokuta, Nigeria, where he obtained his MSc Materials Technology in 1986 and PhD Industrial Chemistry in 2014 respectively.

Frank has over thirty years' experience in his lecturing career with Yaba College of Technology from 1986 till date as chief lecture/Director, lecturing Polymer and Textile Technology courses. He is a fellow, Polymer Institute of Nigeria (FPIN), Member Materials Science and Technology (MMSN) and Member Association of Textile Technologist of Nigeria (MATTN).