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Thermogravimetric study of powdered laboratory safety examination gloves

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This study focused on thermogravimetric analysis (TGA) of powdered laboratory safety examination gloves (PLEG) with the goal of finding the most efficient way to recycle the LEG latent energy in order to clean up the environmental pollution caused by an increasing amount of chlorinated plastic wastes. Thermolysis and gasification processes have been recognized as promising routes for the upgrading of solid wastes to more valuable and energy-dense materials, such as fuel (gas and oil), lubricants, or to high value feedstock useful to the chemical industry. Seven samples of PLEG were studied by two thermal scan and two isotherms one below 410°C and the other at 410°C; while four samples of PLEG were studied at isotherms above 410°C. Four samples that had their first isotherm under 380°C (340, 355, 370, and 375°C) behaved quite differently. The sample of PLEG that was maintained at 340°C for 30 min underwent some internal chemical changes that lead to production of thermal resistance material. From the thermal scans and isotherms, the highest rate of weight loss, the temperature at the maximum weight loss, the apparent order of reaction, the apparent rate constant, and apparent activation energy of weight loss (Ea) were estimated. The experimental results confirmed that Ea of weight loss of LEG samples depended on the temperature of operation. At temperatures below 375°C, the amount of Ea of weight loss from the sample was higher than those at the temperatures above 375°C.

Biography

Nasrollah Hamidi, PhD, is an associate professor in the Department of Biological and Physical Sciences, South Carolina State University, Orangeburg, SC, USA. He has published over 30 articles in peer reviewed journals, and has presented his research in more than 80 scientific meetings.

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