

Emission Behaviors from Mesoporous Silica Powders Containing Cinnamaldehyde

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The mesoporous silica powders containing insect repellent (cinnamaldehyde) were successfully prepared by impregnation of mesoporous materials (MSU-F, MSU-J, AEROSIL). These samples were and characterized by fourier transform (FT-IR) spectroscopy, thermogravimetric analysis (TGA), Brunauer-Emmett-Teller (BET) and transmission electron microscope (TEM). FT-IR spectroscopy data and Brunauer-Emmett-Teller (BET) data showd that cinnamaldehyde was successfully impregnated in the mesoporous silica powder. Thermogravimetric analysis data showed that the mesoporous silica powder was thermally stable up to high temperature. The emission behavior of cinnamaldehyde from a mesoporous silica powder was investigated by gas chromatography/mass spectrophotometry (GC/MS). The diffusion and releasing kinetics of ethanol and cinnamaldehyde were obtained by analyzing the simple exponent type of time dependent fractional mass release equation. The diffusion coefficient of cinnamaldehyde was estimated from the experimentally observed cinnamaldehyde emission behavior.