

Abstract Submitted  
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**Multiple Light Scattering Probes of Polyurethane Foam Structure** WEIJUN ZHOU, The Dow Chemical Company, DWIGHT LATHAM, ANNE LEUGERS — The cellular structure of polyurethane foams is probed quantitatively by investigating the multiple scattering characteristics of foams with near IR wavelength light. In the limit of strong multiple scattering regime, the propagation of light can be approximated as a diffusion process. Static diffusive transmission ( $T\%$ ) of foams showed a rather interesting relationship with foam thickness ( $L$ ) as  $T \sim 1/L$ . This is consistent with what one expects from diffusion theory. The transport mean free path of light diffusion was determined to correlate directly with foam cell size. But surprisingly, the transport mean free path of light within polyurethane foam was found to be smaller than cell size, suggesting a strong intra-cellular scattering mechanism. Applications of multiple light scattering techniques to dynamic foaming process will also be discussed.

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