

Abstract Submitted  
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**Long-range Periodic Structure in Porous High Density Polyethylene Crystallized from the Gel State** SHUJUN CHEN, SAMUEL P. GIDO, Dept. of Polymer Sci. and Eng., Univ. of Mass., Amherst, MA 01003, SOUVIK NANDI, H. HENNING WINTER, Dept. of Chem. Eng., Univ. of Mass., Amherst, MA 01003 — Porous polymeric materials have a variety of applications from filtration membranes, low  $k$  dielectric materials to artificial organs. Characterization of such porous materials, however, has been limited to surface techniques such as SEM and adsorption isotherms. Little work has been done on the internal structure characterization of porous materials due to the difficulty in obtaining suitable samples without disrupting the structure. In this research, a comprehensive structural characterization was performed on porous HDPE material using SEM, TEM, electron diffraction and AFM. The porous HDPE material was obtained through crystallization from swollen crosslinked gels (CSX process) in supercritical propane. SEM showed micron-size open porous structure in the CSX processed HDPE. TEM revealed long-range periodic structure in its pore walls, much different from structures found in typical HDPE material. Electron diffraction and AFM results confirmed the presence of long-range lamella stacking.

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