

Abstract Submitted  
for the MAR07 Meeting of  
The American Physical Society

**Organic-modified and biological silica studied by synchrotron x-ray pair distribution function measurements** ELAINE DIMASI, Brookhaven National Laboratory, CLAYTON JEFFRYES, GREGORY RORRER, Oregon State University, DAVID BELTON, CAROLE PERRY, Nottingham Trent University — Biomineralization is a process by which living organisms create composite organic/mineral tissues which have hierarchical structures on micron and submicron scales. Fine control over mineral phase and morphology make biomineralization an important inspiration for materials science. It is often not appreciated that even amorphous minerals such as silica can exhibit hierarchical structure and special properties. One difficulty is that the molecular structures of amorphous phases can be hard to elucidate. We are exploring the use of pair distribution function measurements from synchrotron x-ray scattering to study silica structures, comparing both synthetic organic-modified silicas and germanium-containing biosilica from diatoms. The raw scattering patterns show clear differences. We will discuss how these data can be scrutinized to determine what differences may be created at the molecular level by different silicification processes.

Elaine DiMasi  
Brookhaven National Laboratory

Date submitted: 19 Nov 2006

Electronic form version 1.4