

Séminaire Physico-chimie & Biologie

Vendredi, 19 Octobre 2012

11 :00

Bât. 563 - salle 15

Mobile surfaces and highly stable glasses (Or how to make a million-year-old glass in 10 minutes)

Mark Ediger

University of Wisconsin-Madison

ediger@chem.wisc.edu

Glasses play an important role in modern technology. The large number of local packing arrangements in a glass underlies their important properties, including macroscopic homogeneity (e.g., the clarity of window glass) and the ability to be tuned by composition changes. A problem with glasses, also associated with their local disorder, is that they are unstable with respect to lower energy glasses and crystalline states. We have used physical vapor deposition and the mobility of glassy surfaces to prepare what are likely the most stable glasses on the planet. Our materials have the properties expected for “million-year-old” glasses, including high density, low enthalpy, and high mechanical moduli. Computer simulations verify and extend our understanding of these unusual materials, and allow a detailed investigation of structure/property relationships. These developments present major opportunities to learn about the lower portions of the potential energy landscape and to design new classes of anisotropic solids.