

Nature-made nanocrystals: PDF study on bacterial and fungal MnO

Valeri Petkov

Dept. Physics, Central Michigan University, Mt. Pleasant, MI 48858
Petkov@phy.cmich.edu

Biogenic materials are produced by microorganisms and are typically found in a nanophase state. As such, they are difficult to characterize structurally. In this talk, we will demonstrate how high-energy x-ray diffraction (XRD) and atomic pair distribution function analysis (PDF) can be used to determine the atomic-scale structures of MnO_x produced by *L. discophora* SP-6 bacteria and *Acremonium strictum* fungi. These structures are well-defined, periodic, and species-specific, built of Mn-O_6 octahedra forming birnessite-type layers and todorokite-type tunnels, respectively. We will also discuss how the inherent structural diversity of biogenic material may be utilized in practical applications.