Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Infrared and optical spectroscopy study of UHMWPE polymers
M.S. WOLF, J.N. MORVAN, John Carroll University, S.V. DORDEVIC, The University of Akron, N. STOJILOVIC, John Carroll University — Ultra-High Molecular Weight Polyethylene (UHMWPE) is very often the material of choice for the bearing surfaces of most hip and knee implants primarily due to its low friction combined with good toughness and abrasion resistance. We investigate optical properties of biomedical-grade UHMWPE GUR 1020 powders and sheets using infrared and UV-vis spectroscopy and compare results with those from industrial grade samples. In addition, we use X-ray diffraction spectroscopy to monitor the changes in crystal structure of these polymers as a function of temperature. Finally, we deliberately oxidize and subsequently characterize these materials since the oxidation of UHMWPE bio- implants is believed to be responsible for their failure in vivo.

Michael Wolf
John Carroll University

Date submitted: 20 Nov 2008 Electronic form version 1.4