

Abstract Submitted  
for the MAR09 Meeting of  
The American Physical Society

**Charge Exchange in Slow Collisions of O<sup>+</sup> with He** L.B. ZHAO, D.C. JOSEPH, B.C. SAHA, Department of Physics, Florida A&M University, Tallahassee, FL-32307, H.P. LEBERMANN, P. FUNKE, R.J. BUENKER, Bergische Universitat Wuppertal, D-42097 Wuppertal, Germany — A comparative study is reported for the charge transfer in collisions of O<sup>+</sup> with He using the fully quantal and semiclassical molecular-orbital close-coupling (MOCC) approaches in the adiabatic representation. The electron capture processes O<sup>+</sup>(<sup>4</sup>S<sup>o</sup>, <sup>2</sup>D<sup>o</sup>, <sup>2</sup>P<sup>o</sup>) + He → O(<sup>3</sup>P) + He<sup>+</sup> are recalculated. The semiclassical MOCC approach was examined by a detailed comparison of cross sections and transition probabilities from both the fully quantal and semiclassical MOCC approaches. The discrepancies reported previously between the semiclassical and the quantal MOCC cross sections may be attributed due to the insufficient step-size resolution of the semiclassical calculations. Our results are also compared with the experimental cross sections and found good agreements. This work is supported by NSF, CREST program (Grant#0630370).

Bidhan Saha  
Florida A&M University, Tallahassee, FL-32307

Date submitted: 23 Nov 2008

Electronic form version 1.4