Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Equation of state, thermodynamic and transport properties in liquid indium and iron under high pressure[1] HUAMING LI, YONGLI SUN, College of Physics and Optoelectronics, Taiyuan University of Technology, MO LI, School of Materials Science and Engineering, Georgia Institute of Technology — We apply a general equation of state of liquid [1] to study thermodynamic properties in liquid indium and iron under high temperature and high pressure. In particular, density, isothermal bulk modulus, and internal pressure are then analyzed in liquid indium and iron. Molar volume of molten indium is calculated along the isothermal line within good precision comparing with the known data from experiments in an externally heated diamond anvil cell. For liquid indium at given parameters, density anomaly, i.e. the minimum volume, is observed along certain isobaric paths. In liquid iron, the entropy scaling law of self –diffusion coefficient and viscosity under high pressure (up to 350GPa) and high temperature (up to 8000K) are investigated. Comparisons are made with experimental data and other EOS models for liquid iron.

[1] V. G. Baonza , M. Caceres and J. Nunez, Phys. Rev. B 51, 28(1995).

[1]Shanxi Provincial government ("100-talents program") and National Natural Science Foundation of China (NSFC) under grant No. 11204200.

Huaming Li
College of Physics and Optoelectronics,
Taiyuan University of Technology,Taiyuan University of Technology

Date submitted: 13 Nov 2014 Electronic form version 1.4