Abstract Submitted
for the APR07 Meeting of
The American Physical Society

Dielectronic Recombination in high-temperature fusion plasma
KHONDKAR KARIM, Illinois State University — Dielectronic recombination is the dominant recombination channel in a low-density high-temperature plasma. In a laboratory fusion plasma with heavy impurity atoms, dielectronic recombination is an important energy-loss mechanism and is to be taken into account in any realistic plasma modeling. We have calculated dielectronic recombination rate coefficients for ions of various ionization stages as a function of plasma temperature. We have also calculated the autoionization rates, radiative transition rates, fluorescence yields, and satellite intensity factors for the relevant atoms and ions. Dielectronic recombination may proceed through an enormous number of intermediate resonance states. We have studied and introduced a scaling law for including the effects of the high-lying resonance states without doing detailed calculations. In particular, we shall report the variation of radiative rates, autoionization rates, satellite intensity factors, and dielectronic recombination rates as a function of atomic number Z and the principal quantum numbers of the resonance states.

Khondkar Karim
Illinois State University

Date submitted: 11 Jan 2007 Electronic form version 1.4