

Low energy range dielectronic recombination of Fluorine-like Fe^{17+} at the CSRm

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Dielectronic recombination is one of the most important electron ion recombination process in astrophysical and men made plasma. The absolute dielectronic recombination rate coefficient of F-like Fe^{17+} ions has been measured at the main cooler storage ring (CSRm), at Institute of Modern Physics Lanzhou, China [1]. The measured electron-ion collision energy range 0-6 eV covered the first Rydberg series of $\Delta n = 0$ core excitations from $2s^2 2p^5(^2P_{3/2}) nl$ to $2s^2 2p^5(^2P_{1/2}) nl$ from $n=18$ up to $n=24$.

The FAC code has been used to calculate DR rate coefficient and compared with experimental results [2]. Plasma rate coefficient were deduced from measured and calculated DR rate coefficient. Overall a reasonable agreement was found between the experimental results and theoretical results from FAC. Our results also compared with previously calculated MCBP, MCDF and measured experimental results of test storage ring (TSR) as shown in figure.1. [3,4]. We will present the DR rate coefficient as well as the obtained plasma rate coefficient of Fluorine-like Fe^{17+} ions at the conference.

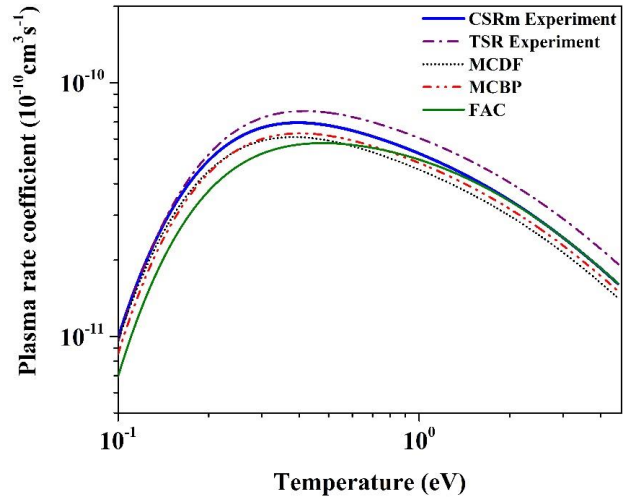


Fig. 1. Comparison of plasma rate coefficients derived from the experimental result with the calculated results from FAC code and also the existed plasma rates coefficients from literature. The thick solid blue line denote experimental results from CSRm and thin solid green line represents FAC calculation. The experimental result from TSR is displayed by Purple dash-dot line and corresponding calculations by MCBP and MCDF are shown by red dashed curve and black dotted curve, respectively.

References

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