Modeling of the kinetics of H_2^+, BeH^+, NH^+ and isotopologues at high energy of the incident electron in fusion plasmas

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The Multichannel Quantum Defect Theory (MQDT) has been employed in computing cross sections and Maxwell rate coefficients for electron-driven reactions involving molecular cations. These data are usefully in the modelling of the kinetics of various cold ionized media of fundamental and applied interest. Rotational and vibrational transitions (RVT) and dissociative recombination (DR) rate coefficients, an extension of our previous studies [1-2] and outline several important features, like isotopic and resonant effects are presented for H_2^+ , HD^+ and D_2^+.

For the fusion plasma edge, extensive cross sections and rate coefficients have been produced for BeH^+ [4], BeD^+ [5] and BeT^+ [6] cations. The isotopic effects demonstrates the quasi-independence of the rate coefficients on the isotopologue, if they are represented with respect to the vibrational energy of the target, at a given electron temperature. The energy of the incident electron is below the dissociative threshold, 2.7eV. New computations on extended energy/temperature range, up to 12 eV/30000 K, are ongoing.

References

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