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Electron Impact Exciation of Fe IX[1] SWARAJ TAYAL, Clark Atlanta Univ, OLEG ZATSARINNY, Drake University — Transition probabilities and electron impact excitation collision strengths and rates for astrophysically important extreme ultraviolet lines of Fe IX are calculated. The 322 fine-structure levels of the $3s^2 3p^6$, $3s^2 3p^5 3d$, $3s 3p^6 3d$, $3s^2 3p^5 4s$, and $3s^2 3p^4 3d^2$ configurations are included in our calculations. The collision strengths have been calculated using the B-spline Breit-Pauli R-matrix method for all fine-structure transitions among the 322 levels. The mass, Darwin, and spin-orbit relativistic effects are included in the Breit-Pauli Hamiltonian in the scattering calculation. The one-body and two-body relativistic operators are included in the multi-configuration Hartree-Fock calculations of transition probabilities. Several sets of non-orthogonal spectroscopic and correlation radial orbitals are used to obtain accurate description of Fe IX levels and to represent the scattering functions. The calculated excitation energies are in very good agreement with experiment and represents an improvement over the previous calculations. The present collision strengths show reasonable agreement with the previously available R-matrix and distorted-wave calculations.

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