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Electron collisions with Fe-peak elements

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Lines of Fe^{+} – Fe^{6+}, ions appear in the UV spectra of O-type stars. Accurate assessments of the relevant abundances of heavy elements and their ions can be obtained from the comparison of the observed spectra with synthetic NLTE spectra, if the atomic data for electron and photon interaction processes are known with sufficient accuracy. Electron-impact excitation collision strengths for such Fe-peak elements are calculated in the close-coupling approximation using the R-matrix method. Accurate multi-configuration interaction target and scattering wavefunctions are used with the aid of $3p^2 \rightarrow 3d^2$ two-electron promotions. Effective collision strengths for optically forbidden transitions in the ground and excited state manifolds, which are extremely important in the analysis of lines in the spectra, are obtained by averaging the electron collision strengths over a Maxwellian distribution for the electron temperature. Samples of results for several of these complexes will be presented, compared and contrasted to previous investigations for temperatures below 10^6 Kelvin with conclusions drawn.

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