

Abstract Submitted  
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**Electron-impact excitation of forbidden and allowed transitions in Cr II**<sup>1</sup> SWARAJ TAYAL, Clark Atlanta University, OLEG ZATSARINNY, Drake University — Electron excitation collision rates and transitions probabilities for iron-peak Cr II ions are needed for the determination of electron temperatures and densities, ionization equilibria, and abundances in the astrophysical plasmas. The collision strengths have been calculated using the B-spline Breit-Pauli R-matrix method. The multiconfiguration Hartree-Fock method in connection with adjustable configuration expansions and semi-empirical fine-tuning procedure is employed for an accurate representation of the target wave functions. The close-coupling expansion contains 512 fine-structure levels of Cr II of the  $3d^44s$ ,  $3d^34s^2$ ,  $3d^5$ ,  $3d^44p$ , and  $3d^44s4p$  configurations. The collision rates are obtained by averaging the electron collision strengths over a Maxwellian distribution of velocities at electron temperatures in the range from  $10^2$  to  $10^5$  K for the 130816 transitions between these fine-structure levels. The present results considerably expand the existing data sets for Cr II, allowing a more detailed treatment of the available measured spectra from different space observatories. Comparison with other calculations for collision rates and available experimental radiative rates is used to assess the likely uncertainties in the existing data sets.

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