

Abstract Submitted
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**Photoionization and Electron-Ion Recombination of Neutral Cr
Using the Unified Method¹** SULTANA NAHAR, The Ohio State University —

The inverse processes of photoionization and electron-ion recombination of neutral chromium, ($\text{Cr I} + h\nu \leftrightarrow \text{Cr II} + e$) for the ground and excited states are studied in detail using the unified method. The unified method based on close-coupling approximation and R-matrix method (i) subsumes both the radiative and dielectronic recombinations for the total rates and (ii) provides self-consistent sets of photoionization cross sections σ_{PI} , and state-specific and total recombination rates α_{RC} . The new results for the total ground and excited state cross sections show enhancement in the background at the first excited core threshold, $3d^44s$ 5D state. Prominent PEC (phot-excitation-of-core) resonance due to the dipole allowed transition in the core is found in photoionization cross sections of most of the excited states. Results are presented for all septet and quintet states with $n \leq 10$ and $l \leq 9$ that couple to the core ground state 6S and contribute to the total recombination rate. The total recombination rate shows at relatively low temperature, two recombination peaks, one at 630 K and the other one at 40,000 K.

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