

The FERRUM project: Experimental Transition Probabilities from Highly Excited Even 5s Levels in Cr II

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We report lifetime measurements of the 5 levels in the $3d^4(a^5D)5s e^6D$ term in Cr II at an energy around 83000 cm^{-1} and $\log(gf)$ values for 38 transitions from the investigated levels. The results are obtained using time-resolved laser-induced fluorescence on ions from a laser-produced plasma. Since the levels have the same parity as the low-lying states directly populated in the plasma, we used a two-photon excitation scheme. This process is greatly facilitated by the presence of the $3d^4(a^5D)4p z^6F$ levels at roughly half the energy difference. The f -values are obtained by combining the experimental lifetimes with branching fractions derived using relative intensities from a hollow cathode lamp recorded with a Fourier Transform spectrometer.

We discuss the techniques, report on experimental values and comparisons with theoretical calculations.