ELECTRONIC SPECTROSCOPY OF WC FROM 17,500 to 24,000 cm^{-1}

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Resonant two-photon ionization spectroscopy has been used to study the diatomic molecule WC. A low resolution scan revealed a five member vibrational progression beginning at 17 585 cm^{-1} with the ν_{00} transition. Analysis of this progression yielded a vibrational frequency of $\omega_e'(^{184}W^{12}C)$ = 752.6(4.9) cm^{-1} and a bond length of $r_e'(^{184}W^{12}C)$ = 1.747(4) Å. In addition, several unassigned bands were rotationally resolved. Interestingly, all of the observed excited states have Ω' = 2. All of the rotationally resolved transitions were fit simultaneously to produce the best possible fit of the ground state. Assignment of these bands confirmed a ground state of $^3\Delta_1$ from a $14\sigma^2 8\pi^4 15\sigma^2 4\delta^1 16\sigma^1$ configuration and determined the ground state as $r_0''(^{184}W^{12}C)$ = 1.7143(2) Å. Dispersed fluorescence studies to elucidate the ground and low-lying excited states will also be reported. These results on WC are compared to the results of studies on MoC and other transition metal carbides.