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An Electron Electric Dipole Moment Search in the $^3\Delta_1$ Ground State of Tungsten Carbide Molecules JEONGWON LEE, AARON LEANHARDT, Department of Physics, University of Michigan, Ann Arbor, Michigan 48109-1040, USA — We report on progress towards constructing and characterizing a continuous tungsten carbide (WC) molecular beam for an electron electric dipole moment (EDM) search¹. Tungsten atoms are evaporated from a resistively heated filament and tungsten carbide molecules are formed through a reaction with methane: $W + CH_4 \rightarrow WC + 2H_2$. WC has a $^3\Delta_1$ ground state with its two valence electrons in a $\sigma\delta$ molecular orbital configuration^{2,3,4}. This molecular structure has several unique advantages for an electron EDM search and arises in other diatomic species such as $HfF^{+5,6}$, $ThF^{+5,7}$, and $ThO^{7,8}$.

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