ELECTRONIC SPECTROSCOPY OF ZrCH IN THE VISIBLE REGION

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Zirconium methylidyne, ZrCH(D) has been produced by reaction of CH_4 or CD_4 with laser-ablated zirconium in a free-jet expansion. The visible-region laser-induced fluorescence spectrum has been recorded. Wavelength-resolved fluorescence spectra have given the ZrCH(D) ground state frequencies ν_2 (bend) = 580 (466) cm^{-1} and ν_3 (Zr-C stretch) = 870 (810) cm^{-1}. Several perpendicular transitions are observed between 590 and 640 nm. Analysis of rotationally-resolved spectra of ZrCH and ZrCD will be presented and the geometry of these molecules will be discussed.