THE ELECTRONIC SPECTRUM AND MOLECULAR STRUCTURE OF THE JET-COOLED SILICON METHYLI-
DYNE (SiCH) RADICAL

TONY C. SMITH, HAIYANG LI, DENNIS J. CLOUTHIER, Department of Chemistry, University of Ken-
tucky, Lexington, KY 40506-0055; CHRISTOPHER T. KINGSTON and ANTHONY J. MERER, Chemistry
Department, University of British Columbia, 2036 Main Mall, Vancouver, BC, Canada V6T 1Z1.

Small hydrogen-containing silicon-carbon compounds are important as potential precursors to the SiCₙ clusters found in stellar atmospheres. In this work, we have observed the A 3Sigma⁺ → X 2Pi electronic transition of the jet-cooled silicon methylidyne radical, produced by fragmentation of tetramethylsilane in a pulsed discharge jet. Extensive systems of rotationally discrete bands of both SiCH and SiCD have been observed in the 855 - 605 nm region. Use of a "reheat tube" at the exit of the jet has allowed us to observe both spin-orbit components, which have a 70 cm⁻¹ separation. High resolution spectra have been obtained for both SiCH and SiCD, providing rotational constants and molecular structures for the ground and excited states.