WHERE DO CARBON-CARBON BONDS ORIGINATE? THE PECULIAR CHEMISTRY OF THE OXYGEN-RICH SUPERGIANT VY CANIS MAJORIS

L. M. ZIURYS, A. J. APPONI, S. MILAM, D. T. HALFEN, and N. J. WOOLF, *Department of Chemistry, Department of Astronomy, Arizona Radio Observatory, and Steward Observatory, University of Arizona, Tucson, AZ 85721*.

The circumstellar envelopes of carbon-rich AGB stars, such as IRC+10216, are known to exhibit a rich chemistry, which includes the formation of molecules with multiple carbon bonds. There are other stars which have circumstellar shells that are oxygen-rich, and the chemistry of these objects is relatively unexplored. In order to further our knowledge of circumstellar chemistry, we have begun a spectral line survey of the envelope of the O-rich supergiant VY Canis Majoris using the Arizona Radio Observatory's 12m facility and Submillimeter Telescope (SMT) at 3, 2, and 1 mm. VY Canis Majoris is a massive object (>15 solar masses) with a large dusty envelope, and a mass loss rate comparable to IRC+10216. Thus far, several transitions of SO, SO_2, and SiO have been identified in this source, as well as HCN and CO. HCO^+ has also been detected in four separate rotational transitions, and tentatively NaCl. In addition, numerous unidentified lines have been discovered. The results of this survey will be presented, as well as the implications for chemistry in an oxygen-rich environment as opposed to one that is carbon-rich.