A SIMULTANEOUS 1 MM SURVEY OF VY CMA AND IRC +10216: COMPARING THE CHEMISTRY OF O-RICH AND C-RICH CIRCUMSTELLAR ENVELOPES

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We are conducting a comparative spectral survey from 210 to 280 GHz towards the circumstellar envelopes of IRC +10216 and VY CMa using The Arizona Radio Observatory's (ARO) 10 m Sub-millimeter Telescope (SMT). The survey utilizes the new ALMA Band 6 sideband separating prototype mixer on the SMT. Low receiver temperatures throughout the survey frequency range enable us to consistently achieve one sigma noise levels of 1-4 mK. Thus far, 63 lines have been observed in VY CMa including 11 U-lines. In contrast, in IRC +10216, 206 lines have been observed, 25 of which are U-lines. The 1.3 mm window spectrum of VY CMa is dominated by emission from simple silicon- and sulfur-bearing species such as SiO, SO_2 and SiS, while in IRC +10216, the majority of lines arise from SiC_2, and C_4H. Both sources appear to exhibit an interesting phosphorus chemistry, and one result of the survey is the detection of the new interstellar molecule, PO, in VY CMa. We will present the general characteristics of the two CSE spectra, and we will discuss implications for circumstellar chemistry.