CHEMICAL STRUCTURE OF THE BARNARD 68 PRE-STELLAR CORE

SÉBASTIEN MARET and EDWIN A. BERGIN, *Department of Astronomy, University of Michigan, 500 Church Street, Ann Arbor, MI 48109-1042*.

Prestellar cores are unique laboratories to study the initial conditions of star formation. Over the past decade, extinction maps and millimeter emission observations have expended our knowledge of the physical structure (density, dust temperature), while millimeter line observations have increased our understanding of the chemistry in these cores. B68 is a representative example of these studies. In the past years, we have mapped extensively this core in different molecular lines. In this contribution, we will present new observations and modeling of the chemistry the cloud. We will show how, using a chemistry model coupled with Monte Carlo code, the molecular abundances as a function of the radius can be derived, providing information on the ionization fraction, gas-phase freeze-out, ionization rate and the unknown ortho-para ratio of molecular hydrogen. Close attention will be paid to using chemistry to improve our interpretation of molecular lines that can be used to trace the kinematics of star formation.