INTERSTELLAR CHEMISTRY: 
Exotic Molecules in Space

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INTRODUCTION

The field of interstellar chemistry had its beginnings in 1968 with the microwave detection of the first interstellar polyatomic molecule, ammonia. Since then over 50 species have been identified in space (Table 1) (1). Before this it had been thought that molecular processes (as opposed, for example, to atomic and nuclear processes) played little or no role in astrophysics. The wealth of molecular radioastronomical data that has accumulated in the last decade demonstrates quite forcefully that this is not true. Analysis of this data requires information about a number of molecular properties and processes which fall traditionally into the area of physical chemistry. However, because conditions in interstellar space are so different from those which are normally attained in the laboratory—essentially zero pressure and nearly zero temperature—attempts to understand interstellar chemistry have stretched the limits of current physical chemical knowledge. The flow of information between molecular radioastronomy and physical chemistry has therefore been reciprocal, and it is likely to remain this way for some time.

Although still quite young, the field of interstellar chemistry has uncovered a remarkably rich and varied phenomenology that has already made important contributions to our understanding of both astronomy and chemistry. In fact, the field is much too broad to be adequately surveyed within the space limitations of this article. Molecular radioastronomical observations have provided important new information for astrophysics, including the morphology and thermal balance of the interstellar medium, clues to stellar evolution, and information about cosmic isotope ratios that

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P.S. Has anyone calculated the expected lifetime of carbonaceous
meteoritic deposition on the moon? What should they use
for surface density?

(As Tommy Gold suggested re 
"ice" one might have to look for semi-
shaded depressions).