

Theoretical Models of Astrochemical Processes

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Interstellar chemistry provides a natural laboratory for studying exotic species and processes at densities, temperatures, and reaction rates, that are difficult or impractical to address in the laboratory. Thus, many chemical reactions considered too slow by the standards of terrestrial chemistry, can be 'observed' and modeled. Various proposals concerning the nature and chemistry of complex interstellar organic molecules will be described. Catalytic reactions on grain surfaces can, in principle, lead to a large variety of species and this has motivated many laboratory and theoretical studies. Gas phase processes may also build large species in molecular clouds. Future laboratory data and computational tools needed to construct accurate chemical models of various astronomical sources to be observed by Herschel and ALMA will be outlined.