1. **Composition and chemical history of early solar system ices**

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Some models of protostellar collapse [1] indicate that all but the most volatile **ices** from the native envelope survive the infall phase, at least at larger disk radii (10 AU). The compn. and chem. **history** of **ices** in circumstellar envelopes, and sometimes in disks, can be traced with IR (2-30 μ) spectroscopy using ground and space based telescopes. Surveys of large samples of Young Stellar Objects (YSOs) [2,3,4] and quiescent clouds [5,6] have shown that the ice abundances and band profiles vary considerably as a function of environment. A rather complex mixt. of simple species (CH3OH, CO2, H2O, NH3, CO) exists even before stars form, most likely reflecting a **history** of chem. on cold grain surfaces. CH3OH abundance variations show that local phys. conditions (CO freeze out) and time scales (CH3OH formation) are key factors in this **early** chem. Sublimation and thermal processing of the **ices** are dominant processes during the YSO's evolution. But, contrary to present day **solar system ices**, the evidence of processing of interstellar and circumstellar **ices** by photons and energetic particles is weak. Lab. expts. are needed to further constrain the processes of mol. formation as well as to det. the origin of several unidentified ice features. Such expts. will also be essential to interpret the sensitive and high spectral resoln. observations that will become possible with new facilities (the SOFIA airplane and JWST satellite).