# Thermal desorption spectroscopic studies of relevant molecules in Interstellar medium on olivine and single crystal forsterite

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More than 140 different molecules have been reported in various regions of interstellar space [1]. The dense molecular clouds of our galaxy are considered to have temperature in the range of 10-20 K [2]. Hence most of the molecules in interstellar medium are in the form of ices. Major molecular constituents of interstellar ices are $H_2O$, CO, $CH_4$, $CO_2$, $NH_3$ and other small molecules [2]. In cold temperature these molecules collide with and stick to silicate and carbonaceous dust grain particles and forms icy mantles [3].Temperature programmed desorption (TPD) is one of the most widely used characterization technique to investigate the properties of the ices under realistic condition to get a deeper understanding of the interstellar ices and dust particles. It provides adsorbate binding energies, Pre-exponential factors, desorption order and the character of the interactions. Starting at 4K we performed TPD measurements on several molecules like $D_2$, CO, $CH_4$,$CO_2$ and $NH_3$ adsorbed on single crystal forsterite (MgSiO4) and olivine ( $Mg_x$ $Fe_{1-x}$ $SiO_4$) surfaces. For calculating the energies we use Redhead approximation method and also the complete analysis method in the leading edge. Averaging over several measurements, it is seen that $D_2$, CO, $CH_4$, $CO_2$ molecules have slightly greater average binding energies on forsterite than on olivine.

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