Interstellar Dusts and their Laboratory Analog

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The interstellar medium (ISM), the vast space between the stars, is a rich reservoir of complex molecules. Since solar systems like ours are evolved in the ISM, the study of generation mechanisms of these molecules in the ultra cold and ultra high vacuum conditions of ISM is of paramount importance. In the last decade, it has become clear that gas phase reactions alone can not explain the molecular abundances in the ISM. The chemical reactions that occur on interstellar dust grains are needed to explain the formation of several molecules including simplest and most abundant, molecular hydrogen. There are two ways in which interstellar dust grains control the chemistry. In one, it provides the surface for chemical reactions, in other, the dusts control the gas phase chemistry through freeze out and desorption processes, which can significantly affect the formation of complex molecules in the gas phase. Attempts to simulate the interstellar environment in laboratory is made in few places around the world. In this talk I will discuss how it is done, present results of a similar study which involves interstellar CO and O₂ and also discuss some recent experimental findings.