Tracing silicates from interstellar dust to planetary materials

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Abstract

Silicates are one of the major refractory solid dust grain component of the interstellar medium and is ubiquitous from nearby planet forming disks to galaxies. The grains are primarily made of Si and O with varying amounts of Mg and Fe. They can be present in amorphous or crystalline form depending on the environment. In this talk, I will outline our understanding of how silicates can be formed in laboratory and how they are identified through infrared signatures. This will help us to bridge our understanding to interpret observations. I will also show a few examples on how silicates have a role to play in different astrochemical processes-ranging from ice growth and surface chemistry to radiation driven grain alteration. These tiny silicates particles have a major role to play in planet formation. When we trace their journey from interstellar dust to planetary materials, we gain insight into chemical pathways that link star-forming regions to the formation of planetary systems.

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