

# Infrared Spectra of LIME olivine

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From observational and experimental works, infrared spectra of solid-solution of Mg-Fe olivine were well investigated after Infrared Space Observatory (ISO). Here we will report infrared spectra of Mg-Mn olivine,  $(\text{Mg, Mn})_2\text{SiO}_4$ , for the first time. This type of solid solution is known as "Low Iron Manganese Enriched (LIME) silicate", and has often discovered characteristically in the primitive interplanetary dust particles (IDPs). The formation of LIME olivine also can be explained by the condensation sequence theory. In this work we carried out synthesis of some Mg-Mn olivine solid solutions with various Mn concentrations, and measured the infrared absorption spectra ( $8 \mu\text{m} \sim 100 \mu\text{m}$ ).

From results, we found that the spectra of the samples have great resemblance to those of Mg-Fe olivine, as a whole. But, it can be distinguished from each other by use of correlation of peak positions between  $49 \mu\text{m}$  and  $69 \mu\text{m}$  features. From the view point of the solar abundance, the abundance of Mn is roughly 1 % of those of Mg and Fe. In general, 1 % is the lowest limit of detection in infrared spectroscopy. But, upcoming high sensitivity space observatory mission with SPICA could detect the LIME olivine and distinguish the difference between Fe and Mn contents.