Thermoluminescence and Optically stimulated Luminescence of Ammonia-doped ice

Takeshi Yada[1], Kimihiro Norizawa[2], Makoto Hirai[3], Chihiro Yamanaka[2], Motoji Ikeya[4]

[1] Earth and Space Sce., Osaka Univ, [2] Earth and Space Sci., Osaka Univ., [3] Earth and Space Sci., Osaka Univ, [4] Earth and Space Sci. Osaka Univ.

Icy bodies like Io have surfaces of solid SO2, H2O, and CH4 with impurity like ammonia. Solar wind and cosmic ray produce free radicals and metastable molecules in icy bodies. Therefore we must investigate chemical reactions of the species stimulated thermally and optically to study chemical evolution of molecules on icy bodies. We made an apparatus for TL and OSL and measured ammonia-doped ice.

Solidified NH3 water was irradiated by gamma-rays. OSL measurement were performed using red LED as stimulating source of OSL. TL measurement was carried out by heating the sample temperature linearly from 77 to 220K.

We measured OSL of ammonia-doped ice. TL peak at about 210 K is easily bleachable.

There are TL centers sensitive to optically stimulation and not sensitive one.