Electron spin resonance study of free radicals in amorphous ice

Kimihiro Norizawa[1], Takeshi Yada[2], Motoji Ikeya[3]

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

H2O are deposited on solar system bodies of ice and become amorphous not crystalline ice. Since amorphous ice can adsorb many kinds of molecules because of its porous structure, photolysis of adsorbed molecules is important to know chemical evolutions in space. Electron spin resonance (ESR) method can directly detect free radicals, which are very important in chemical reactions. Amorphous ice samples were deposited on the copper finger at 77 K in a vacuum from water vapor and irradiated by low-pressure mercury lamp. The ESR spectra of samples doped with 1% H2O2 showed the radical formation of HO2 and we identified the matrix as amorphous ice by comparing with spectra reported by Bednarek (1996). We report the ESR analysis of UV-irradiated amorphous ice samples adsorbing simple molecules.