Detection of photodesorption OH radicals from H_2O ice surface by visible light

Ayane Miyazaki[1], Naoki Watanabe[1], W. M. C. Sameera[1], Yoichi Nakai[2], Masashi Tsuge[1], Testuya Hama[3], Hiroshi Hidaka[1], Akira Kouchi[1]

[1] *Institute of Low Temperature Science, Hokkaido University, Japan*
[2] *Nishina Center, RIKEN, Japan*
[3] *Komaba Institute for Science, The University of Tokyo, Japan*

There are various molecules including complex organic molecules in interstellar molecular clouds. Surface reactions involving radicals on interstellar ice-dust grain play an important role in chemical evolution because they are indispensable for the formation of complex interstellar molecules [1,2]. In order to understand the details of the molecular formation on the surface of dust, it is necessary to clarify the behavior of radicals on the surface. However, the detection of radicals on ice surface has intrinsic experimental difficulties.

In this study, we investigated behavior of OH radicals on the ice surface. Because they can be easily produced by photolysis of ice and would greatly contribute to the formation of complex molecules or those precursors. Using the combination of photo-stimulated desorption and resonance-enhanced multiphoton ionization, we have first succeeded in monitoring OH radicals on ice [3]. The results of the experiments indicate that photodesorption of OH radicals are induced by one photon absorption at 532 nm, which is transparent for gaseous OH radical as well as for water ice. I present the details on the behavior of OH radicals and adsorption sites on water ice [4,5].

References

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