

(Dr.) Andrey F. Vilesov

Professor, Department of Chemistry, University of Southern California, U.S.A.

Staying Period: March 8, 2003 - March 20, 2003

Host: T. Momose (Div. Chem., Grad. Sch. Sci.)

The invited researcher is a pioneer of the spectroscopy of molecules in superfluid helium nano-droplets, which is now becoming a major field of spectroscopy of cold molecules. Helium nano-droplets consists of 10^3 - 10^5 helium atoms with the temperature of 0.4 K. The droplets are in superfluid phase, so that molecules embedded in helium droplets rotate almost freely as in the gas phase. It has been shown that the helium droplets are extremely useful for the study of properties of molecules at very low temperature as well as those of weakly bounded clusters.



Prof. Vilesov

During his visit, he mainly worked with students in Momose's lab. at the Department of Chemistry, Graduate School of Science to help them to build a new helium-droplet machine in Kyoto. The new machine in Kyoto is for the study of superfluidity of hydrogen molecules, which is a collaborative research with Professor Vilesov. As a test of the new machine we have measured LIF spectrum of phtalocyanine embedded in helium droplets.

He gave a lecture at the Department of Chemistry, Graduate School of Science on March 17th (Monday), 2003. The title



Prof. Vilesov (left) and his host (T. Momose) at the lecture

of the lecture was "superfluid helium droplets: a unique nano-matrix for molecules." In the talk he gave general introduction of the helium nano-droplets to the audience of more than 20 people. In addition he showed his new results on the study of metal clusters. He discussed that helium droplets is a useful technique for the production of any metal alloy.