THE GLASS BULLET - A NOVEL TECHNIQUE FOR SECURE SUBLIMATION OF HIGHLY AIR-SENSITIVE SAMPLES INTO CRYOGENIC MATRICES

W. E. KLOTZBÜCHER, *Max-Planck-Institut für Strahlenchemie, D-45413 Mülheim a. d. Ruhr, Germany*.

Small ligands like CO, C_2H_4 or N_2 play an important role in the rich and well-established chemistry of the d-block transition metals. By contrast very little is known about analoguous complexes of the f-block transition metals - organometallic metal carbonyls of the lanthanide group are unknown.

So far the very few rare-earth carbonyl (and dinitrogen) species investigated have been synthesized in cryogenic matrices by cocondensation of naked metal atoms with appropriate gas mixtures. We have developed a novel (generally applicable) sample handling technique, which allowed the controlled codeposition of extremely air-sensitive organometallic holmium sandwich molecules with inert and reactive matrix gases. Extended photolysis of molecules trapped in neat CO resulted in formation of a novel carbonyl species, which by analogy with a similar chromium complex is identified as the half-sandwich $Ho(Bz^*)(CO)_3$, the first organometallic lanthanoid carbonyl.