

## RADIATION- AND PLASMA-INDUCED RADICAL FORMATION IN FLUOROCHLOROCARBONS AND REACTIONS WITH SEMICONDUCTOR MATERIALS

U. Prösch, K. Buttke, L. Tepper and K.-D. Suhrke

Humboldt-Universität zu Berlin, Sektion Chemie, 1040 Berlin, Hessische Strasse 1-2 (G.D.R.)

Non-thermal energy (ionizing radiation, high frequency electrical discharge) generates halogen atoms from halocarbons which react readily with adjacent solid materials. The mechanism and extent of such processes depend on the physical state of the systems, the method by which the energy is applied and the chemical properties of the compounds used.

We have studied the formation of hydrolyzable inorganic halides irradiating  $C_2F_3Cl_3$  (with Co-60 gamma radiation) in the presence of small arsenic particles as well as gallium spheres. The results may be interpreted by a heterogenous scavenger action, but at least with gallium a radiationinduced direct surface reaction has to be included.

Under the influence of a high frequency plasma discharge  $CF_2Cl_2$  gas reacts at low pressure with GaAs. The removal of GaAs from a wafer and the yields of hydrolyzable inorganic halides were measured at various power densities and with admixture of oxygen. The results are describable with a kinetic model, if a plasmachemical yield, defined similar to the G-value of radiation chemistry, is introduced.

Thus the common features which originate from the chemical nature of the halocarbons are recognizable.