

I-43

FLUORINATION OF SOLID UF_6 DECOMPOSITION PRODUCTS BY GASEOUS MIXTURES OF $CBrF_3$ AND F_2

W. Bacher, E. W. Becker, W. Bier and A. Maner

Institut für Kernverfahrenstechnik des Kernforschungszentrums, Karlsruhe, Postfach 3640, 7500 Karlsruhe (F.R.G.)

E. Jacob

M.A.N. Neue Technologie, Postfach 500620, 8000 Munich 50 (F.R.G.)

Gaseous mixtures of $CBrF_3$ and F_2 exhibit some advantages in the removal of solid UF_6 decomposition products from uranium enrichment installations [1]. To facilitate optimal application we have studied the self decomposition of this mixture as well as its interaction with $UO_2F_2 \cdot H_2O$ within a stainless steel cell equipped with AgCl windows for IR analysis.

It has been found that in the self decomposition under low F_2 content BrF_3 shows up besides the common reaction products BrF_5 and CF_4 . Within certain limits, the reaction rate for the fluorination of $UO_2F_2 \cdot H_2O$ increases with decreasing F_2 content of the mixture.

The fluorination of $UO_2F_2 \cdot H_2O$ results in a retardation of the BrF_5 formation as compared to the formation of CF_4 . This indicates a temporary accumulation of bromine in low valent states on the surface of the solid uranium compound.

For practical application of mixtures with low F_2 content it is important to know that after the total consumption of F_2 the residual $CBrF_3$ may attack the UF_6 formed by fluorination of the solid uranium compound. Therefore F_2 has to be added or the mixture has to be pumped off in time.

1 W. Bacher, W. Bier, E. Jacob, A. Maner, paper to the 10th Int. Symp. on Fluorine Chemistry, Vancouver (1982).