

REACTIONS BETWEEN CHROMIUM FLUORIDES AND NOBLE GAS FLUORIDES

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In the system chromium(V) fluoride - xenon(II) fluoride besides of already known $\text{XeF}_2 \cdot 2\text{CrF}_4$ [1] also a new blue xenon(II) fluorochromate(IV) was isolated by the reaction: $\text{CrF}_5 + n\text{XeF}_2 \rightarrow \text{XeF}_2 \cdot \text{CrF}_4 + 1/2\text{XeF}_4 + (n-1.5)\text{XeF}_2$. This compound was obtained also by the reaction: $\text{CrF}_4 + n\text{XeF}_2 \rightarrow \text{XeF}_2 \cdot \text{CrF}_4 + (n-1)\text{XeF}_2$. Xenon difluoride is not able to oxidize chromium above 3+ oxidation state. Brick red $\text{XeF}_6 \cdot \text{CrF}_4$ [2] was isolated in the system chromium fluorides (CrF_x with x being 2, 3, 4, 5) - xenon hexafluoride. It is observed that CrF_5 is reduced to 4+ oxidation state even in oxidative environment of xenon hexafluoride. Although considered as a relatively strong Lewis acid, CrF_5 is not strong enough to form its XeF_5^+ salt. From vibrational spectra it could be concluded that $\text{XeF}_2 \cdot \text{CrF}_4$ is XeF^+ salt and $\text{XeF}_6 \cdot \text{CrF}_4$ is XeF_5^+ salt. The anionic parts of both spectra are similar. In the system chromium fluorides-krypton difluoride only chromium pentafluoride is obtained. A new method [3] designed for the preparation of polymeric in AHF insoluble binary fluorides was used for the preparation of CrF_4 . Its magnetic measurements indicate strong interactions between chromium atoms.

1. J. Slivnik and B. Žemva, Z. anorg. allg. Chem., **385**, 137 (1971)
2. B. Žemva, J. Zupan and J. Slivnik, J. inorg. nucl. Chem., **35**, 3941 (1973)
3. B. Žemva, K. Lutar, A. Jesih, W.J. Casteel, Jr., and N. Bartlett, J. Chem. Soc., Chem. Commun., 346 (1989)