IMPROVED SYNTHESIS OF $Te_6(AsF_6)_4$, and $TeF_3.AsF_6$

Ramesh Kapoor*, Michael P. Murchie and Jack Passmore

Department of Chemistry, University of New Brunswick,
Fredericton, New Brunswick, E3B 6E2 (Canada).

$$6Te + 6\ AsF_5 \xrightarrow[SO_2,\ r.t.]{\text{traces of } Br_2} Te_6(AsF_6)_4 + 2\ AsF_3 \qquad (1)$$

$$Te + 3\ AsF_5 \xrightarrow[SO_2,\ r.t.]{\text{traces of } Br_2} TeF_3.AsF_6 + 2\ AsF_3 \qquad (2)$$

Original preparation of $Te_6(AsF_6)_4$ [1] involved the reaction of elemental tellurium with excess AsF_5 for several days followed by a tedius and not totally complete separation from $Te_4(AsF_6)_2$. The present method involves the oxidation of tellurium with AsF_5 in the presence of traces of Br_2 in SO_2 at r.t. (eq. 1). The sparingly soluble $Te_6(AsF_6)_4$ is easily separated from other side products, TeF_4 and $TeF_3.AsF_6$ as they are highly soluble in SO_2. $TeF_3.AsF_6$ was detected by NMR in the solutions of TeF_4 and excess AsF_5 in SO_2 [2]. The present preparation of TeF_3AsF_6 (eq. 2) is effected in a simple one step, without the prior preparation of TeF_4, which is prepared by the reaction of TeO_2 and SF_4 at high pressure[3]. The method has been extented (eq. 3) to give TeF_4 but needs careful removal of traces of $TeF_3.AsF_6$.

$$Te + 2\ AsF_5 \xrightarrow[SO_2,\ r.t.]{\text{traces of } Br_2} TeF_4 + 2\ AsF_3 \qquad (3)$$

1. R.C.Burns, R.J.Gillespie, W.C.Luk, and D.R.Slim, Inorg. Chem. **18**, 3086 (1979).
2. M.J.Collins and G.J.Schrobilgen, Inorg. Chem. **24**, 2608 (1985).
3. K.Seppelt, Inorg. Synth. **20**, 33 (1980).

---

* Department of Chemistry, Panjab University, Chandigarh, India.