Triiodotelluronium Hexafluoroarsenate TeI$_3$[AsF$_6$].
The Crystal Structure of the Hemi SO$_2$ Solvate and the Structure Relation to the Unsolvated Form

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TeI$_3$[AsF$_6$] is formed from Te, I$_2$, and AsF$_5$ in liquid SO$_2$. At room temperature light red crystals of the hemi SO$_2$ solvate TeI$_3$[AsF$_6$] · 0.5 SO$_2$ are obtained from a saturated solution. The crystal structure (orthorhombic, $Pnna$, $a = 1107.41(2)$, $b = 1866.58(3)$, $c = 1207.00(2)$ pm at 123 K, $Z = 8$) consists of pyramidal TeI$_3^+$ cations (Te-I = 267 pm), almost regular octahedral [AsF$_6$]$^-$ anions and of SO$_2$ molecules which show disorder for the O atom positions. A remarkable feature of the crystal structure is the arrangement of the TeI$_3^+$ ions that are pairwise associated, facing each other with the I atoms and forming large voids between each other. This causes the significantly lower density of TeI$_3$[AsF$_6$] · 0.5 SO$_2$ (3.88 Mgm$^{-3}$) in comparison to the unsolvated form (4.20 Mgm$^{-3}$, Passmore 1981).

Key words: Triiodotelluronium(+), Hexafluoroarsenate(V)(−), Sulfurdioxide Solvate, Crystal Structure