

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

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$\text{TeI}_3[\text{AsF}_6]$  is formed from Te,  $\text{I}_2$ , and  $\text{AsF}_5$  in liquid  $\text{SO}_2$ . At room temperature light red crystals of the hemi  $\text{SO}_2$  solvate  $\text{TeI}_3[\text{AsF}_6] \cdot 0.5 \text{ SO}_2$  are obtained from a saturated solution. The crystal structure (orthorhombic,  $Pnmm$ ,  $a = 1107.41(2)$ ,  $b = 1866.58(3)$ ,  $c = 1207.00(2)$  pm at 123 K,  $Z = 8$ ) consists of pyramidal  $\text{TeI}_3^+$  cations ( $\text{Te-I} = 267$  pm), almost regular octahedral  $[\text{AsF}_6]^-$  anions and of  $\text{SO}_2$  molecules which show disorder for the O atom positions. A remarkable feature of the crystal structure is the arrangement of the  $\text{TeI}_3^+$  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  $\text{TeI}_3[\text{AsF}_6] \cdot 0.5 \text{ SO}_2$  ( $3.88 \text{ Mgm}^{-3}$ ) in comparison to the unsolvated form ( $4.20 \text{ Mgm}^{-3}$ , Passmore 1981).

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