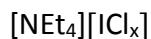


Answer on Question #71395 – Chemistry – General Chemistry

When chlorine is bubbled through an ethanol solution of [NEt₄]I a bright yellow precipitate results. Elemental analysis of the product reveals that it contains 3.51% nitrogen. Use this information to elucidate the product of this reaction. Write a balanced equation for the reaction and use VSEPR theory to predict the structure of the solid. What is the oxidation state of iodine at the end of the reaction?

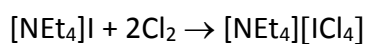
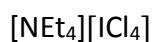
Solution:



$$w(\text{N}) = \frac{Ar(\text{N})}{Ar(\text{N}) + Mr(\text{Et}_4) + Ar(\text{I}) + x \times Ar(\text{Cl})} = \frac{14}{14 + (12 \times 2 + 4) \times 4 + 127 + x \times 35.5} = 0.0351$$

$$0.0351 \times (253 + 35.5 \times x) = 14$$

$$x = 4$$



Square planar structure

oxidation state of iodine (I) = +3