

**2006 AP<sup>®</sup> CHEMISTRY FREE-RESPONSE QUESTIONS (Form B)**



6. The species represented above all have the same number of chlorine atoms attached to the central atom.
- (a) Draw the Lewis structure (electron-dot diagram) of each of the four species. Show all valence electrons in your structures.
- (b) On the basis of the Lewis structures drawn in part (a), answer the following questions about the particular species indicated.
- (i) What is the  $\text{Cl} - \text{Ge} - \text{Cl}$  bond angle in  $\text{GeCl}_4$ ?
  - (ii) Is  $\text{SeCl}_4$  polar? Explain.
  - (iii) What is the hybridization of the I atom in  $\text{ICl}_4^-$ ?
  - (iv) What is the geometric shape formed by the atoms in  $\text{ICl}_4^+$ ?