

Chapter 7 – Problems 56, 58, 64

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56. In each of the following polyatomic ions, the central atom has an expanded octet. Determine the number of electron pairs around the central atom and the hybridization in:



Electron Pairs: 6
Hybridization: sp^3d^2



Electron Pairs: 6
Hybridization: sp^3d^2



Electron Pairs: 5
Hybridization: sp^3d

58. Acrylonitrile, $\text{C}_3\text{H}_3\text{N}$, is the building block of the polymer Orlon. What is the hybridization of nitrogen and of the three numbered carbon atoms?

- (a) N – sp
(b) C (1) – sp^2
(c) C (2) – sp^2
(d) C (3) – sp

64. Give the number of sigma and pi bonds in the molecule in Question 58

$$\begin{aligned}\sigma &\longrightarrow 6 \\ \pi &\longrightarrow 3\end{aligned}$$