

For the following: (a) draw the Lewis structure, (b) write the VSEPR formula, (c) define shape, (d) identify the hybridization of the central atom, and (e) draw the geometric formula.

1. SiF_4

$1-\text{Si} \rightarrow 4$
 $4-\text{F} \rightarrow 28$
 $\frac{32}{-8}$
 $\frac{24}{24}$

$\text{F} \vdots \text{Si} \vdots \text{F}$
 $\vdots \quad \vdots$
 $\text{F} \quad \text{F}$

AX_4LP_0 tetrahedral sp^3

2. BBr_3

$1-\text{B} \rightarrow 3$
 $3-\text{Br} \rightarrow 21$
 $\frac{24}{-6}$
 $\frac{18}{18}$

$\text{Br} \vdots \text{B} \vdots \text{Br}$
 $\vdots \quad \vdots$
 $\text{Br} \quad \text{Br}$

AX_3LP_0 trigonal planar sp^2

- remember B + Al can survive with only 6 valence e⁻

3. NF_3

$1-\text{N} \rightarrow 5$
 $3-\text{F} \rightarrow 21$
 $\frac{26}{-6}$
 $\frac{20}{20}$

$\text{F} \vdots \text{N} \vdots \text{F}$
 $\vdots \quad \vdots$
 $\text{F} \quad \text{F}$

AX_3LP_1 trigonal pyramidal sp^3

4. CS_2

$1-\text{C} \rightarrow 4$
 $2-\text{S} \rightarrow 12$
 $\frac{16}{-8}$
 $\frac{8}{8}$

$\text{S} = \text{C} = \text{S}$

AX_2LP_0 linear sp

$\text{S} = \text{C} = \text{S}$

5. AsCl_5

$1-\text{As} \rightarrow 5$
 $5-\text{Cl} \rightarrow 35$
 $\frac{40}{-10}$
 $\frac{30}{30}$

$\text{Cl} \vdots \text{As} \vdots \text{Cl}$
 $\vdots \quad \vdots$
 $\text{Cl} \quad \text{Cl}$

AX_5LP_0 trigonal bipyramidal sp^3d

6. SF_6

$1-\text{S} \rightarrow 6$
 $6-\text{F} \rightarrow 42$
 $\frac{48}{-12}$
 $\frac{36}{36}$

$\text{F} \vdots \text{S} \vdots \text{F}$
 $\vdots \quad \vdots$
 $\text{F} \quad \text{F}$

AX_6LP_0 octahedral

7. CH_2N_2

$1-\text{C} \rightarrow 4$
 $2-\text{H} \rightarrow 2$
 $2-\text{N} \rightarrow 10$
 $\frac{16}{-12}$
 $\frac{4}{4}$

$\text{H} \quad \text{C} = \text{N} = \text{N} \cdot$
 $\text{H} \quad \quad \quad \cdot$

AX_3LP_1 (for C) trigonal planar sp^2

AX_2LP_0 (for N) linear sp