

1. Draw a Lewis structure for each of these molecules.

- SiCl_4
- PF_3
- CS_2
- HOBr
- BrF_5

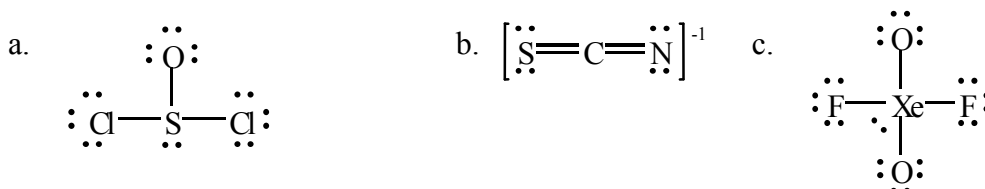
2. Draw all the possible resonance structures (indicated in parentheses) for each of these molecules.

- NO_3^{1-} (3)
- N_2O (3)
- SO_2 (2)
- SO_3 (3)

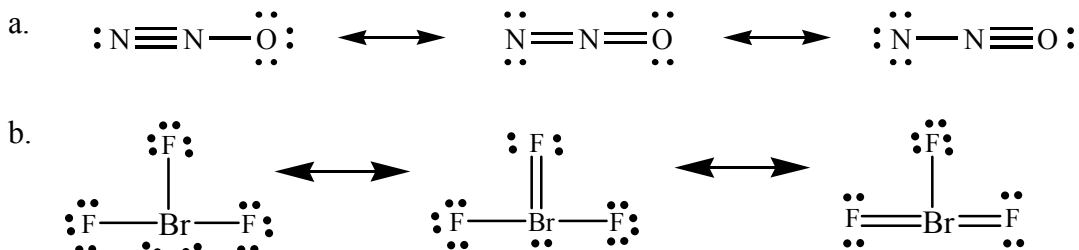
3. Indicate whether the bond formed between each of the following pairs would be pure covalent, polar covalent, or ionic.

- | | | |
|-------------|-------------|------------|
| a. C and Br | b. P and As | c. K and O |
| d. Br and F | e. Sr and S | f. N and B |

4. Identify the formal charges on each element in these structures.



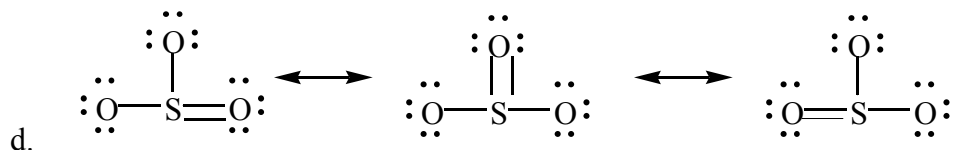
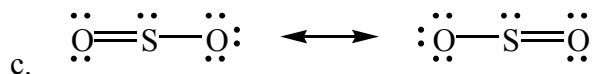
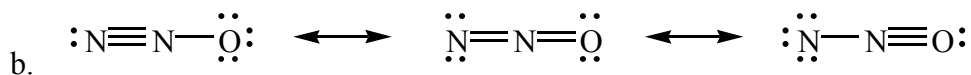
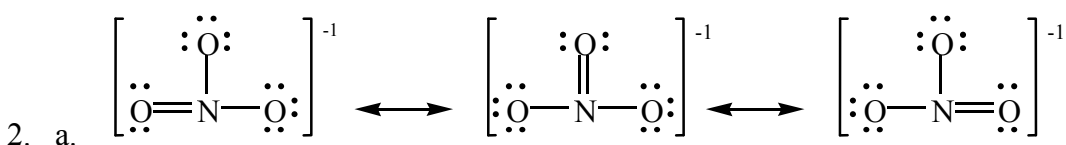
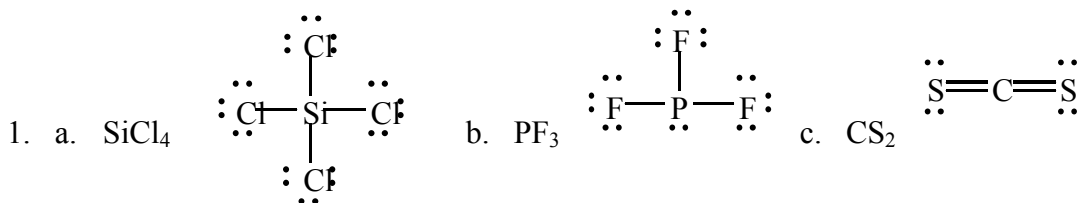
5. Use formal charges to determine which resonance structure is the one that most closely resembles the real structure of the molecule indicated:



6. Use the table of bond energies to calculate ΔH_{rxn} for each of these reactions.

- $2 \text{HCl} + \text{N}_2 \rightarrow \text{Cl}_2 + \text{HNNH}$
- $\text{H}_2\text{CCH}_2 + 3 \text{O}_2 \rightarrow 2 \text{CO}_2 + 2 \text{H}_2\text{O}$

Answers:



3. a. pure covalent b. pure covalent c. ionic
d. polar covalent e. polar covalent f. polar covalent

4. a. S +1 b. S 0 c. Xe +2
O -1 C 0 O -1
Cl 0 N -1 F 0

5. a. first structure, O has -1 formal charge
b. first structure, everything has a formal charge of 0

6. a. $\Delta H_{rxn} = + 369 \text{ kJ}$ b. $\Delta H_{rxn} = 1291 \text{ kJ}$