

9.7 End-of-Chapter Material

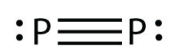
ADDITIONAL EXERCISES

1. Explain why iron and copper have the same Lewis electron dot diagram when they have different numbers of electrons.
2. Name two ions with the same Lewis electron dot diagram as the Cl^- ion.
3. Based on the known trends, what ionic compound from the first column of the periodic table and the next-to-last column of the periodic table should have the highest lattice energy?
5. Based on the known trends, what ionic compound from the first column of the periodic table and the next-to-last column of the periodic table should have the lowest lattice energy?
7. P_2 is not a stable form of phosphorus, but if it were, what would be its likely Lewis electron dot diagram?
8. Se_2 is not a stable form of selenium, but if it were, what would be its likely Lewis electron dot diagram?
9. What are the Lewis electron dot diagrams of SO_2 , SO_3 , and SO_4^{2-} ?

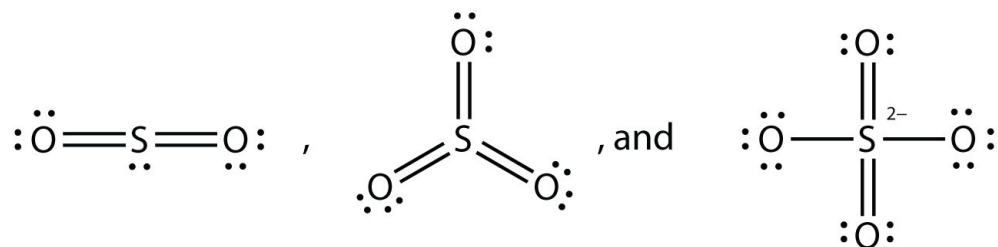
10. What are the Lewis electron dot diagrams of PO_3^{3-} and PO_4^{3-} ?
11. Which bond do you expect to be more polar—an O–H bond or an N–H bond?
12. Which bond do you expect to be more polar—an O–F bond or an S–O bond?
13. Use bond energies to estimate the energy change of this reaction.
 $\text{C}_3\text{H}_8 + 5\text{O}_2 \rightarrow 3\text{CO}_2 + 4\text{H}_2\text{O}$
14. Use bond energies to estimate the energy change of this reaction.
 $\text{N}_2\text{H}_4 + \text{O}_2 \rightarrow \text{N}_2 + 2\text{H}_2\text{O}$
15. Ethylene (C_2H_4) has two central atoms. Determine the geometry around each central atom and the shape of the overall molecule.
16. Hydrogen peroxide (H_2O_2) has two central atoms. Determine the geometry around each central atom and the shape of the overall molecule.

ANSWERS

1. Iron has *d* electrons that typically are not shown on Lewis electron dot diagrams.
3. LiF
5. It would be like N_2 :



7.



9. an O–H bond

11. –2,000 kJ

13. trigonal planar about both central C atoms