Non Sibi High School

Andover's Chem 550/580: Advanced Chemistry

Chapter 9, Review Quiz 1 Answers

1

Write the chemical formula for each compound:

a. ammonium phosphate
b. butanol
c. aluminum sulfate
d. potassium nitride

a. $NH_4{}^+$, $PO_4{}^{3-} \longrightarrow (NH_4)_3PO_4$
b. organic alcohol $\longrightarrow C_4H_9OH$
c. Al^{3+}, $SO_4{}^{2-} \longrightarrow Al_2(SO_4)_3$
d. K^+, $N^{3-} \longrightarrow K_3N$

2

Write the name of each compound:

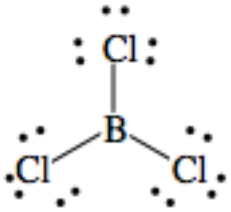
a. $Fe(OH)_3$
b. P_2O_5
c. $Mg(HCO_3)_2$
d. C_6H_{14}

a. Fe^{3+}, $OH^- \longrightarrow$ iron(III) hydroxide
b. binary molecular $\longrightarrow$ diphosphorus pentoxide
c. Mg^{2+}, $HCO_3{}^- \longrightarrow$ magnesium bicarbonate (or hydrogen carbonate)
d. organic alkane $\longrightarrow$ hexane

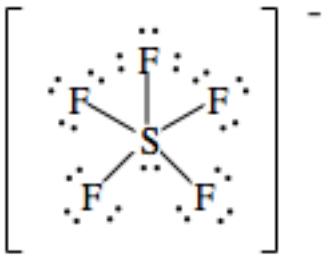
3

Draw Lewis structures for:

a. boron trichloride

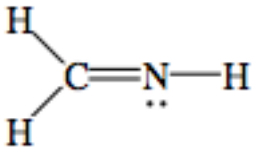


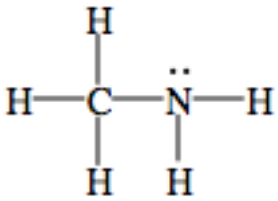
b. SF_5^-



4

Draw Lewis structures for H_2CNH and CH_3NH_2. Which molecule will have the longer carbon-to-nitrogen bond length?

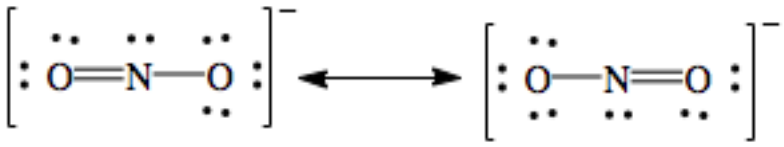




CH_3NH_2 has a single bond between carbon and nitrogen, whereas CH_2NH has a double bond between carbon and nitrogen. Fewer bonds = longer bond length, so CH_3NH_2 has the longer carbon-to-nitrogen bond length.

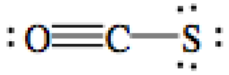
5

Draw all the resonance structures for NO_2^-



6

Show any non-zero formal charges on the following Lewis structure:



FC for O = 6 - 2 - 0.5(6) = +1
FC for C = 4 - 0 - 0.5(8) = 0
FC for S = 6 - 6 - 0.5(2) = -1