ROSEDALE ACADEMY

Acid and Base Worksheet - Answers

1) Using your knowledge of the Brønsted-Lowry theory of acids and bases, write equations for the following acid-base reactions and indicate each conjugate acid-base pair:

a) $HNO_3 + OH^- \rightarrow$ **$H_2O + NO_3^-$**
HNO_3 and NO_3^- make one pair
OH^- and H_2O make the other

b) $CH_3NH_2 + H_2O \rightarrow$ **$CH_3NH_3^+ + OH^-$**
CH_3NH_2 and $CH_3NH_3^+$ make one pair
OH^- and H_2O make the other

c) $OH^- + HPO_4^{-2} \rightarrow$ **$H_2O + PO_4^{-3}$**
HPO_4^{-2} and PO_4^{-3} make one pair
OH^- and H_2O make the other

2) The compound NaOH is a base by different theories of acids & bases. However, each of the theories describes what a base is in different terms. Use your knowledge of these theories to describe NaOH as an Arrhenius base and a Brønsted-Lowry base.

- **NaOH is an Arrhenius base because it creates OH^- ions when placed in water.**
- **NaOH is a Brønsted-Lowry base because it accepts H^+ ions from acids.**

3) Write an equation for the reaction of potassium metal with hydrochloric acid.
$2\ K + 2\ HCl \rightarrow 2\ KCl + H_2$

5) Borane (BH_3) is a basic compound, but doesn't conduct electricity when you dissolve it in water. Explain this, based on the definitions of acids and bases that we discussed in class.
Borane is a Lewis base, but a negligibly strong Brønsted-Lowry base.

6) Write the names for the following acids and bases:

a) KOH **potassium hydroxide**

b) H_2Se **hydroselenic acid**

c) $C_2H_3O_2H$ **acetic acid**

d) $Fe(OH)_2$ **iron(II) hydroxide**

e) HCN **hydrogen cyanide or hydrocyanic acid**

7) Write the formulas for the following chemical compounds (remember, you've still got a pop quiz coming up before the end of next week!)

a) ammonium sulfate **$(NH_4)_2SO_4$**

b) cobalt (III) nitride **CoN**

c) carbon disulfide **CS_2**

d) aluminum carbonate **$Al_2(CO_3)_3$**

e) chlorine **Cl_2**