Brönsted/Lowry Theory
Practice Acid Base Questions

1. In a weak acid (HA) solution, how do the number of HA molecules compare to the number of H^+ ions present?

2. Write a balanced equation for the ionization of :

(a) $HCN + H_2O_{(l)} \rightleftarrows$

(b) NH_2 (base) + $H_2O_{(l)} \rightleftarrows$

(c) $HBr + H_2O_{(l)} \rightleftarrows$

(d) CH_3NH_2 (base) + $H_2O_{(l)} \rightleftarrows$

3. Arrange the following 1.0 M solutions in order of ***decreasing*** pH.
(Hint: what are their K_a's? *When molarities are equal, stronger acid = lower pH*)

CH_3COOH , H_3PO_4, LiOH , NH_3

_____
Highest pH Lowest pH

4. What kind of relationship is there between the [H+] and [OH-]? Explain…

5. Complete the following ionization reactions:

(a) $HI_{(aq)} + H_2O_{(l)} \rightleftarrows$

(b) CH_3NH_2 + $H_2O_{(l)} \rightleftarrows$
(base)

(c) $HNO_{2(aq)} + H_2O_{(l)} \rightleftarrows$

(d) NH_3 + $H_2O_{(l)} \rightleftarrows$
(base)

6. Give an example of :

(a) a strong acid _____ (b) a strong base _____ (c) a weak base _____

7. Give the conjugate base for:

(a) H_3PO_4 _____ (b) HCO_3^- _____

8. Give the conjugate acid for:

(a) OH^- _____ (b) SO_4^{2-} _____

9. Rank the following 1.0 M solutions in order of ***increasing*** pH:

LiOH, HF, H_2S, HBr

_____

lowest *highest*

10. Give the conjugate base for:

(a) H_2SO_4 _____ (b) HCOOH _____

11. Give the conjugate acid for:

(a) NH_3 _____ (b) CO_3^{2-} _____

12. Rank the following 1.0 M solutions in order of ***increasing*** pH:

$HClO_4$, HF, NH_3, H_2CO_3

_____

lowest highest