ACIDS and BASES
Worksheet 2

1. Classify each of the following substances as an acid or a base according to the Arrenius Definition:

a.) $HNO_{3\,(aq)}$
b.) $KOH_{\,(aq)}$
c.) $Ca(OH)_{2\,(aq)}$
d.) $HCl_{\,(aq)}$
e.) $NaOH_{\,(aq)}$

2. Classify each of the following substances as an acid, a base, or amphoteric substance according to the Bronsted-Lowry Definition:

a.) NH_4^+
b.) H_3O^+
c.) H_2SO_4
d.) H_2O

3. Give the name of the conjugate base of each of the following acids:

a.) HCN
b.) HSO_4^-
c.) HF
d.) HNO_2

4. Give the name of the conjugate acid of each of the following bases:

a.) NH_3
b.) HCO_3^-
c.) HS^-
d.) Br^-

5. Give the name of the conjugate partner of each of the following acids or bases:

a.) SO_4^{-2}
b.) HI
c.) S^{-2}
d.) HNO_3

6. In each of the following acid-base reactions, identify the acid and base on the left, and their conjugate partners on the right:

a.) $CHOOH_{\,(aq)} + H_2O_{\,(l)} \leftrightarrow HCOO^-_{\,(aq)} + H_3O_{\,(aq)}$
b.) $H_2S_{\,(aq)} + NH_{3\,(aq)} \leftrightarrow NH_4^+{}_{(aq)} + HS^-_{\,(aq)}$

7. Identify the following as a Lewis Acid or Lewis Base:

a.) PH_3 b.) BCl_3 c.) H_2S

ACIDS and BASES
Worksheet 1 Answers

1. Classify each of the following substances as an acid or a base according to the Arrenius Definition:

a.) **ACID**
b.) **BASE**
c.) **BASE**
d.) **ACID**
e.) **BASE**

2. Classify each of the following substances as an acid, a base, or amphoteric substance according to the Bronsted-Lowry Definition:

a.) **ACID**
b.) **ACID**
c.) **ACID**
d.) **AMPHOTERIC**

3. Give the name of the conjugate base of each of the following acids:

a.) **CN^-**
b.) **SO_4^{-2}**
c.) **F^-**
d.) **NO_2^-**

4. Give the name of the conjugate acid of each of the following bases:

a.) **NH_4^+**
b.) **H_2CO_3**
c.) **H_2S**
d.) **HBr**

5. Give the name of the conjugate partner of each of the following acids or bases:

a.) **HSO_4^-**
b.) **I^-**
c.) **HS^-**
d.) **NO_3^-**

6. In each of the following acid-base reactions, identify the acid and base on the left, and their conjugate partners on the right:

a.) $CHOOH_{(aq)}$ = **ACID**
$H_2O_{(l)}$ = **BASE**
$HCOO^-_{(aq)}$ = **C.B.**
$H_3O_{(aq)}$ = **C.A.**

b.) $H_2S_{(aq)}$ = **ACID**
$NH_{3\,(aq)}$ = **BASE**
$NH_4^+{}_{(aq)}$ = **C.A.**
$HS^-_{(aq)}$ = **C.B.**

7. Identify the following as a Lewis Acid or Lewis Base:

a.) PH_3 = **L.B.**
b.) BCl_3 = **L.A.**
c.) H_2S = **L.B.**