**CONCEPT:** ACID-BASE REACTIONS

- Common **Acid-Base Reactions** include reactions of _____ with:

  (a) hydroxide ($OH^-$) bases, (b) neutral *amines*, (c) metals and (d) metal oxides ($O^{2-}$).

  - **Amines:** compounds containing (N & H) or (C, N & H). - Neutral Amines are _____ bases.

## Acid-Base Reactions

### (a) Acid Reacts with Hydroxide Base.

□ Acid and Base produce _____ and _____ as product.

HBr (aq) + LiOH (aq) ⟶ _____ (l) + _____ (aq)

### (b) Acid Reacts with a Neutral Amine.

□ Neutral Amine = Weak Base □ Example: $NH_3$ & $CH_3NH_2$

□ Acid and Base produce _____.

$HNO_3$ (aq) + $NH_3$ (aq) ⟶ _____ (aq)

### (c) Acid Reacts with Metal.

□ Common metals include: Na, K, Mg, Ca, Fe, Zn, Al, Sn

□ Acid and metal produce _____ and _____ as product.

$H_2SO_4$ (aq) + Fe (s) ⟶ _____ (g) + _____ (aq)

### (d) Acid Reacts with Metal Oxides ($O^{2-}$).

□ Example of Metal Oxides: $Li_2O$, $Na_2O$, $K_2O$, MgO, CaO, BaO, FeO.

□ Acid and metal oxide produce _____ and _____ as product.

2 HCl (aq) + FeO (s) ⟶ _____ (l) + _____ (aq)

**EXAMPLE:** Complete the following reaction:

HF (aq) + KOH (aq) ⟶ _____ + _____

**PRACTICE**: Write a balanced chemical equation for the following acid-base reaction:

Bromic acid reacting with hydrazine ($N_2H_4$).

a. $HBrO_3$ (aq) + $N_2H_4$ (aq) ⟶ $N_2H_5BrO_3$ (aq)

b. $HBrO_4$ (aq) + $N_2H_4$ (aq) ⟶ $N_2H_5BrO_4$ (aq)

c. $HBrO_3$ (aq) + $N_2H_4$ (aq) ⟶ $H_2BrO_3$ (aq) + $N_2H_3^-$ (aq)

d. $HBrO_4$ (aq) + $N_2H_4$ (aq) ⟶ $BrO_4^-$ (aq) + $N_2H_4^+$ (aq)

**CONCEPT:** ACID-BASE REACTIONS

**PRACTICE**: Write a balanced chemical equation, include phases, for the following acid reaction: $HClO_3$ reacting with Zn metal.

**PRACTICE**: Write a balanced chemical equation, include phases, for the following acid reaction: HBr reacting with $Li_2O$.