

## 5 • Reactions in Aqueous Solution

### Station 1 – ACIDS, BASES, AND NEUTRALS

Classify each statement as talking about an [A]cid, [B]ase, or [N]eutral.

\_\_\_\_\_ feels slippery

\_\_\_\_\_ tastes sour

\_\_\_\_\_ KOH

\_\_\_\_\_ turns cabbage juice red

\_\_\_\_\_ tastes bitter

\_\_\_\_\_ cabbage juice stays purple

\_\_\_\_\_ CH<sub>3</sub>OH

\_\_\_\_\_ turns “phenol red solution” yellow

\_\_\_\_\_ increases [OH<sup>-</sup>]

\_\_\_\_\_ increases [H<sup>+</sup>]

\_\_\_\_\_ H<sub>2</sub>SO<sub>3</sub>

\_\_\_\_\_ NaHCO<sub>3</sub>

*Hint: only one of these is neutral.*

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### Station 2 – SOLUBILITY RULES

Circle the ionic compounds that are Insoluble (i.e. circle the precipitates):

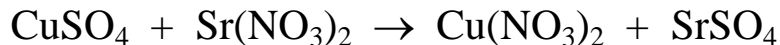
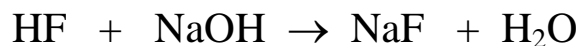
MgF <sub>2</sub>	CuSO <sub>4</sub>	NH <sub>4</sub> Cl	Fe(OH) <sub>3</sub>	CsF
AgCl	CdS	CuF <sub>2</sub>	PbSO <sub>4</sub>	Ba(OH) <sub>2</sub>
Na <sub>2</sub> SO <sub>4</sub>	NH <sub>4</sub> OH	Sr(NO <sub>3</sub> ) <sub>2</sub>	Hg <sub>2</sub> I <sub>2</sub>	Na <sub>2</sub> CrO <sub>4</sub>
BaCO <sub>3</sub>	PbBr <sub>2</sub>	CaC <sub>2</sub> O <sub>4</sub>	HC <sub>2</sub> H <sub>3</sub> O <sub>2</sub>	MgO

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### Station 3 – WRITE THE IONIC EQUATION

For the following molecular equations, write the ionic equation and underline out the spectators:

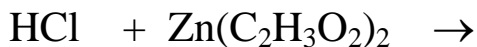
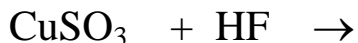


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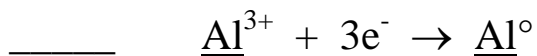
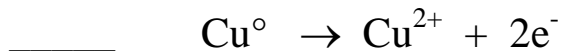
### Station 4 – PREDICT THE PRODUCTS

Predict the products in these molecular equations. Indicate (s), (l), (g), or (aq):



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Anion name	Anion formula	Acid formula	Acid name
cyanide			
chlorate			
hypochlorite			
sulfide			
sulfate			
sulfite			
nitrate			
acetate			

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\_\_\_\_\_ gaining electrons

\_\_\_\_\_ oxidation number increases



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### Station 7 – OXIDATION NUMBERS

Determine the oxidation number of the underlined element:

$\underline{\text{Mg}}\text{F}_2$	$\text{Cu}\underline{\text{S}}\text{O}_4$	$\underline{\text{N}}\text{H}_4^+$	$\underline{\text{C}}\text{O}_2$
$\underline{\text{A}}\text{gCl}$	$\underline{\text{C}}\text{r}_2\underline{\text{O}}_7^{2-}$	$\underline{\text{C}}\text{I}\text{O}_3^-$	$\underline{\text{S}}\text{iH}_4$

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### Station 8 – MOLARITY PROBLEMS

Solve the following problems:

A 2.00 mole sample of NaOH is dissolved in enough water to make 500. mL of solution. What is the concentration of the solution?

60.0 grams of NaOH (MM = 40.00 g·mol<sup>-1</sup>) is dissolved in enough water to make 0.750 L of solution. What is the concentration of the solution?

A 250. mL sample of a 0.125 M solution of NaOH contains \_\_\_\_\_ grams of NaOH.

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### Station 9 – DILUTIONS AND STOICHIOMETRY

*Show your work for these problems:*

You need to make 2.00 L of 0.200 M HCl.

What volume of concentrated HCl (11.65 M) should you dilute? \_\_\_\_

Given the equation:  $\text{Al}_2\text{O}_3(\text{s}) + 6 \text{HCl}(\text{aq}) \rightarrow 3 \text{H}_2\text{O}(\text{l}) + 2 \text{AlCl}_3(\text{aq})$

What volume of 0.250 M HCl is needed to completely react with 25.0 grams  $\text{Al}_2\text{O}_3$  (MM = 101.96  $\text{g}\cdot\text{mol}^{-1}$ ).

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