South Pasadena • Chemistry Name_____ Period___

4 • Classifying Chemicals

1 • pH and pOH

Fill in the missing information:

$[H^+]$	pH	pOH
1×10^{-5}		
	3	
		2
2.5×10^{-3}		
	6	
		1

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2 • $[H^+]$ and $[OH^-]$

Fill in the missing information:

$[H^+]$	$[OH^-]$
1×10^{-4}	
	1×10^{-8}
1×10^{-10}	
	1×10^{-2}
2×10^{-6}	
	3.3×10^{-7}
4.8×10^{-3}	
	1.6×10^{-1}

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4 • Classifying Chemicals

3 • ACIDS, BASES, and SALTS

State whether each chemical is an acid, a base, or a salt.

If it is an <u>acid or a base</u>, state whether it is strong or weak:

1. H_2SO_4 _____ _____
2. $Mg(OH)_2$ _____ _____
3. KBr _____ _____
4. HI _____ _____
5. $HC_2H_3O_2$ _____ _____
6. NH_4OH _____ _____
7. HNO_3 _____ _____
8. Li_2CO_3 _____ _____
9. NaOH _____ _____
10. HF _____ _____

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4 • Classifying Chemicals

4 • MOLARITY

Calculate the concentration of each of these mixtures:

KOH = 56.1 g/mole NaOH = 40.0 g/mol

1. 4 moles KOH in enough water to make 2 L of solution.

2. 0.1 mole NaOH in enough water to make 0.05 L of solution.

3. 0.25 mole KOH in enough water to make 500 mL of solution.

4. 60 grams of NaOH in enough water to make 800 mL of solution.

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5 • DILUTION PROBLEMS

Answer the following problems about diluting solutions:

$$V \cdot \underline{M} = V \cdot \underline{M}$$

1. A 50 mL sample of 6 M HCl is diluted to a volume of 250 mL. What is the new concentration?

2. What volume of 18.0 M H_2SO_4 is needed to make 100 mL of a 1.5 M H_2SO_4 solution?

3. Calculate the concentration of a solution made by diluting 30 mL of 12 M HCl to a volume of 900 mL.

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6 • PROPERTIES OF ACIDS & BASES

Use the following key:

a) Acid
b) Base
c) Both Acid and Base

___1. tastes bitter
___2. electrolyte
___3. increases $[OH^-]$
___4. turns cabbage pink
___5. neutralizes NaOH
___6. increases $[H^+]$
___7. tastes sour
___8. neutralizes HCl
___9. feels slippery
___10. decreases $[OH^-]$
___11. turns cabbage blue/green
___12. proton donor
___13. decreases $[H^+]$
___14. corrosive
___15. proton acceptor

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7 • ACID-BASE NEUTRALIZATION

Write balanced equations showing how the following acids and bases neutralize each other:

1. $HCl + NaOH \rightarrow$ _____ + _____

2. $H_2SO_4 + KOH \rightarrow$ _____ + _____

3. $HCl + Mg(OH)_2 \rightarrow$ _____ + _____

4. $HC_2H_3O_2 + NaOH \rightarrow$ _____ + _____

5. $HNO_3 + NH_4OH \rightarrow$ _____ + _____

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8 • DISSOCIATION EQUATIONS

Consider the following dissociation equation: $H_2SO_4 \rightarrow 2\ H^+ + SO_4^{2-}$

Write the ions into which the following compounds dissociate:

1. $HCl \rightarrow$

2. $NaOH \rightarrow$

3. $Ca(OH)_2 \rightarrow$

4. $HC_2H_3O_2 \rightarrow$

4 • Classifying Chemicals

9 • COMMON CHEMICALS

Match these substances with their chemical formulas:

___1.	table salt	a)	HCl
___2.	milk of magnesia	b)	$CaCO_3$
___3.	water	c)	$Mg(OH)_2$
___4.	stomach acid	d)	H_2O_2
___5.	sugar	e)	$HC_2H_3O_2$
___6.	limewater	f)	H_2O
___7.	household ammonia	g)	NH_4OH
___8.	hydrogen peroxide	h)	$C_{12}H_{22}O_{11}$
___9.	chalk	i)	$Ca(OH)_2$
___10.	drain cleaner (lye)	j)	H_2SO_4
___11.	vinegar	k)	$NaOH$
___12.	battery acid	l)	$NaCl$