

## SNC2DI Chemistry : Review

1. Be able to recognize and understand the importance of the following terms:

Chemistry	Stable octet	Anion	Synthesis reactions
Matter	Ion	Law of Conservation of Mass	Decomposition reactions
Atom	Metal	Chemical formula	Single displacement reactions
Protons	Non-metal	Binary compounds	Double displacement reactions
Neutrons	Metalloid	Poly-atomic ions	Signs of chemical changes
Electrons	Chemical Family or Group	Covalent bond	Acids
Atomic number	Chemical Period	Covalent compound	Bases
Mass number	Ionic bond	Products	pH scale
Isotopes	Ionic compound	Reactants	Neutralization reactions
Valence electrons	Cation	Word & Balanced Equations	pH indicator

2. Complete the chart for the following atoms and ions:

Element Name	Symbol	Atomic Number	# of Protons	# of Electrons	# of Neutrons	Mass Number	Overall Charge
Phosphorus	P	15	15	18	23	38	3 -
manganese	Mn	25	25	23	31	56	+2
magnesium			12		14		0
	F			10		19	
		18			21		0
	Mg					25	2 +
Scandium				18	23		
				21	31		4 +
			34	36		79	
				18	19		1 -

3. What relationship is there between the atoms of manganese shown in question 2? \_\_\_\_\_



15. Complete the following chart, assuming that hydrogen is a non-metal. Use the chemical formula to find the number of atoms or ions of each element that are present in each compound.

Chemical Formula	Ionic or Covalent Compound?	Number of Each Type of Atom in this Compound
$C_2H_2F_4$		
$Na_2O$		
$Ba(NO_3)_2$		
$NOCH_3$		
$Ca(HCO_3)_2$		
$Sn_3(PO_4)_4$		

16. Name the following **ionic compounds** (remember to use Roman Numerals where necessary):

- |                     |                         |
|---------------------|-------------------------|
| a) $CaO$ _____      | f) $Na_2CO_3$ _____     |
| b) $PbCl_4$ _____   | g) $Fe_2O_3$ _____      |
| c) $BaS$ _____      | h) $Mg(NO_3)_2$ _____   |
| d) $CrCl_3$ _____   | i) $Co_2(SO_4)_3$ _____ |
| e) $Al(OH)_3$ _____ | j) $NH_4(HCO_3)$ _____  |

17. Write the chemical formulas for the following ionic compounds:

- |                                 |                                    |
|---------------------------------|------------------------------------|
| a) silver carbonate _____       | f) manganese (II) bromide _____    |
| b) nickel (III) hydroxide _____ | g) ammonium phosphate _____        |
| c) iron (II) sulfide _____      | h) zinc carbide _____              |
| d) cobalt (III) nitrate _____   | i) tin (IV) hydrogen sulfate _____ |
| e) molybdenum (V) oxide _____   | j) gold (I) phosphide _____        |

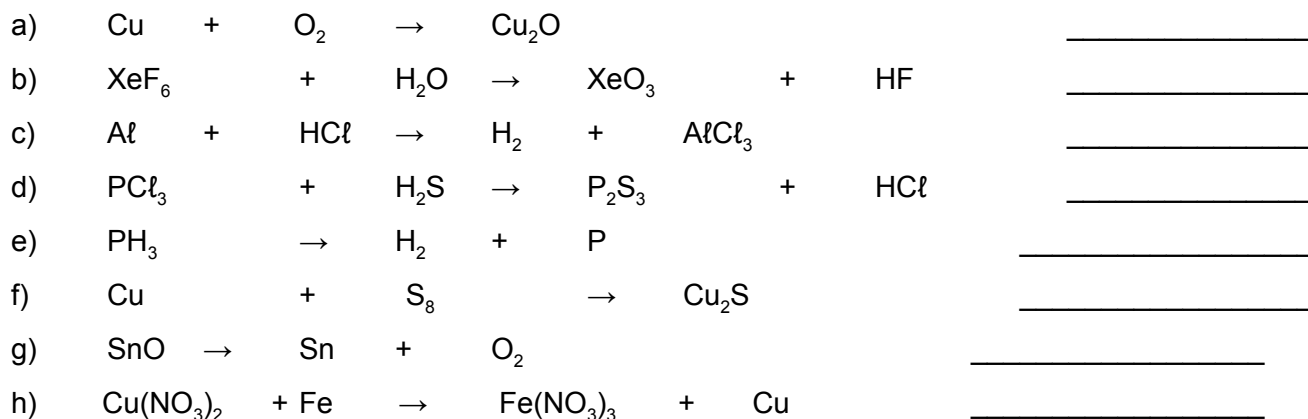
18. Write the chemical formulas of the following **covalent compounds**:

- |                                 |                                |
|---------------------------------|--------------------------------|
| a) carbon tetrachloride _____   | e) tricarbon octahydride _____ |
| b) diphosphorus tetroxide _____ | f) nitrogen triiodide _____    |
| c) bromine pentafluoride _____  | g) silicon dioxide _____       |
| d) selenium monoxide _____      | h) iodine heptachloride _____  |

19. Write the names of the following covalent compounds.

- |                      |                   |
|----------------------|-------------------|
| a) $SF_6$ _____      | e) $CH_4$ _____   |
| b) $P_4O_{10}$ _____ | f) $N_2S_5$ _____ |
| c) $Cl_2O_7$ _____   | g) $OF_2$ _____   |
| d) $SeF_2$ _____     | h) $NH_3$ _____   |

20. Balance the following chemical reactions. Classify each reaction.



21. Write word equations and balanced chemical equations for the following reactions:

- chromium (II) sulfate reacts with calcium nitride to form chromium (II) nitride and calcium sulfate
- propane ( $\text{C}_3\text{H}_8$ ) burns in air to produce carbon dioxide and water
- hydrogen peroxide ( $\text{H}_2\text{O}_2$ ) breaks down to form water and oxygen gas
- aluminum metal reacts with iron (III) oxide to form iron metal and aluminum oxide

22. What are the four signs that a chemical change has taken place?

23. What causes a substance to be acidic, basic or neutral?

24. Identify the following as acids, bases or neutral substances from their chemical formulas and write their names:

$\text{HClO}_3$	$\text{H}_3\text{PO}_3$	$\text{NH}_4\text{OH}$	$\text{Cd}(\text{OH})_2$
$\text{H}_2\text{O}$	$\text{NaCl}$	$\text{Mg}(\text{OH})_2$	$\text{HBr}$

_____ Toothpaste	(pH 8.1)
_____ Window cleaner	(pH 11.6)
_____ Mouthwash	(pH 7.2)
_____ Vinegar	(pH 2.5)
_____ Grape juice	(pH 3.5)
_____ Hair remover	(pH 11.7)
_____ Oven cleaner	(pH 13.7)
_____ Coke	(pH 3.1)

25. A student tested the pH of several household items. She found the pH values shown in the chart to the right. Write acid or base in the space beside each substance.

26. Referring to the pH values in question 34:

a) How many times stronger is vinegar than grape juice?

\_\_\_\_\_

b) Which is stronger: hair remover or oven cleaner?  
 \_\_\_\_\_ By how many times? \_\_\_\_\_

c) Which substance is the strongest acid? \_\_\_\_\_

d) Which substance is the strongest base? \_\_\_\_\_

27. What are three chemical indicators that can be used to identify acids and bases? What colour does each indicator turn in an acidic solution and in a basic solution?

28. Write the general word equation for the reaction that occurs when an acid and a base are mixed.

29. What happens to the **properties** of acids and bases when they are mixed together?