Science 10

**Review – SA: Chemistry #3**

(October 2019)

**Part 1 – Multiple Choice**

Print the letter of the best answer on the line provided.

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C 1. What is the correct name for the $N^{3-}$ ion?

a) nitrogen ion
b) nitrate ion
c) nitride ion
d) nitrite ion

$N^{3-}$ green periodic table

D 2. In the following reaction, which substance is the salt? $HBr + NaOH \rightarrow H_2O + NaBr$

a) HBr
b) NaOH
c) $H_2O$
d) NaBr

acid base salt

B 3. Which of the following compounds contains the lead (II) ion?

a) $Pb_2O$
b) PbO
c) $Pb_2S$
d) $PbCl_4$

+2 $[Pb_1O_1]^{-2}$ -2

A 4. Which is true about the composition of ionic compounds?

a) They are composed of cations and anions.
b) They are formed from two or more nonmetallic ions.
c) They are composed of only anions.
d) They are composed of only cations.

+ - NaCl metal

D 5. Which of the following is the correct name for $N_2O_5$?

a) nitrous oxide
b) pentanitrogen dioxide
c) nitrate oxide
d) dinitrogen pentoxide

nm pentaoxide molecular cpd prefixes

D 6. Which of the following formulas represents an ionic compound?

a) $CS_2$
b) $PCl_3$
c) $N_2O_4$
d) $BaI_2$

metal

Combustion

$C_3H_8 + O_2 \rightarrow CO_2 + H_2O$

neutralization

$Na^+ Cl^-$

$HCl + NaOH \rightarrow NaCl + H_2O$

acid base salt water

A 7. Molecular compounds are usually
a) composed of two nonmetals.
b) composed of positive and negative ions.
c) composed of a metal and a nonmetal.
d) composed of two or more transition metals.

molecular nm or metalloid

B 8. Which of the following shows a prefix used in binary molecular compounds with its corresponding number?
a) hexa – 8
b) nona – 9
c) di - 7
d) penta - 3

D 9. Given, $2Ca + O_2 \rightarrow 2CaO$, what is the 2 located in front of calcium called?
a) subscript
b) product
c) reactant
d) coefficient

Reactants Product. 2 Ca + O 2 → 2 CaO subscript

C 10. Which of the following dissolves in water to produce a basic aqueous solution?
a) LiF
b) $CaBr_2$
c) $Mg(OH)_2$
d) HCl

$H_2O$ $(OH)^-$

A 11. If an acid is spilt on a laboratory table, which of the following substances should be added to it neutralize it?
a) sodium hydroxide
b) acetic acid
c) citric acid
d) water

← salt

acid + □ → salt + $H_2O$

D 12. In a neutralization reaction, the two products are a
a) salt and acid
b) base and acid
c) water and base
d) water and salt

acid + base → salt + $H_2O$

C 13. A formation reaction can be compared to:
a) two dancing couples switching partners
b) a person "cutting in" on a dancing couple
c) two single people joining for a dance
d) a couple breaking up

a) DR
b) SR.
d) D

D 14. The substances to the left of the arrow in a chemical reaction are called
a) products
b) coefficients
c) subscripts
d) reactants

R → P

B 15. An example of an oxyacid is
a) $H_2O$
b) HClO
c) HBr
d) HCN

a) $H_2O$ ← Water
b) HClO

**Part 2 – Reaction Types**

a) Identify each type of chemical reaction by printing F for formation, D for decomposition, SR for single replacement, DR for double replacement, C for combustion or N for neutralization on the line provided.

b) Balance each reaction.

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SR $2\,Cr + 3\,Fe(NO_3)_2 \rightarrow 3\,Fe + 2\,Cr(NO_3)_3$

F $4\,Sc + 3\,O_2 \rightarrow 2\,Sc_2O_3$

DR -> N $2\,Al(OH)_3 + 3\,H_2CO_3 \rightarrow Al_2(CO_3)_3 + 6\,H_2O$

SR -> C $C_9H_{20} + 14\,O_2 \rightarrow 9\,CO_2 + 10\,H_2O$

D $Ag_2Te \rightarrow 2\,Ag + Te$

DR $Mg(BrO_3)_2 + 2\,KSCN \rightarrow Mg(SCN)_2 + 2\,KBrO_3$

**Part 3 – Translating Word Equations and Sentences to Balanced Chemical Equations**
Use the following word equations and sentences to write balanced chemical equations.

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1. aluminum metal + sulfur ⟶ aluminum sulfide

$16Al + 3S_8 \rightarrow 8Al_2S_3$

2. tetracarbon decahydride + oxygen ⟶ carbon dioxide + water

$2C_4H_{10} + 13O_2 \rightarrow 4CO_2 + 5H_2O$

3. Barium metal reacts with nickel (III) fluoride to produce barium fluoride and nickel metal.

$3Ba + 2NiF_3 \rightarrow 3BaF_2 + 2Ni$

4. Niobium (V) iodide yields niobium metal and iodine.

$2NbI_5 \rightarrow 2Nb + 5I_2$

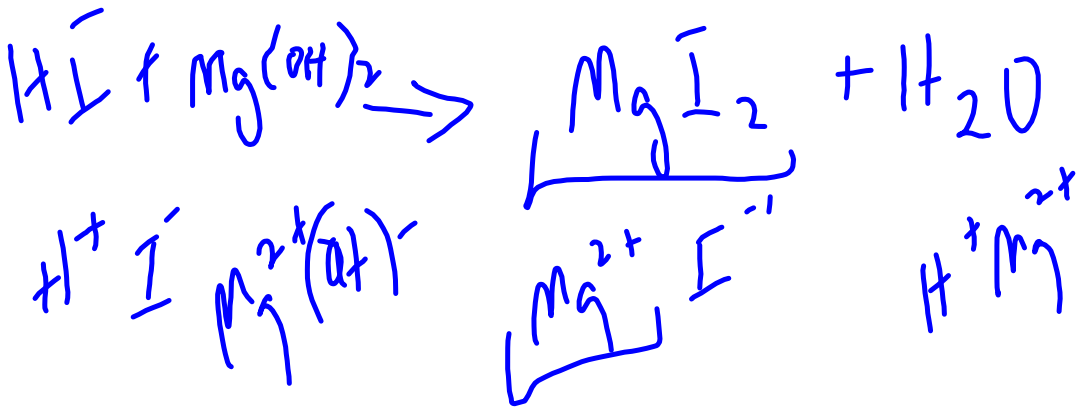
5. Hydrobromic acid combines with calcium hydroxide to produce calcium bromide and water.

$2HBr + Ca(OH)_2 \rightarrow CaBr_2 + 2H_2O$

**Part 4 – Acids and Bases**

For each of the following ionic compounds, name the acid and base that reacted to form them.

| Salt | Acid | Base |
|---|---|---|
| a) $MgI_2$ | hydroiodic acid | magnesium hydroxide |
| b) $AlBO_3$ | boric acid | aluminum hydroxide |
| c) $Cr(NO_2)_2$ | nitrous acid | chromium hydroxide |



**Part 5 – Predicting Products**

Predict the products for the following reactions, balance the equation, then classify the type of reaction:

a) 3 $Na + FeBr_3 \rightarrow 3NaBr + Fe$

b) 4 $PF_3 \rightarrow P_4 + 6F_2$ $PF_3 \rightarrow P_4 + F_2$

c) 2 $KMnO_4 + ZnCl_2 \rightarrow 2KCl + Zn(MnO_4)_2$

d) 2 $RbOH + H_2SO_4 \rightarrow Rb_2SO_4 + 2H_2O$ 2H (2H)

e) $C_5H_{12} +$ 8 $O_2 \rightarrow 5CO_2 + 6H_2O$ 10 6

3