"REVIEW QUESTIONS FOR CHAPTER 3"

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Q 1. Group 2A elements in periodic table, in their compounds, always have an oxidation state of ……

A. +1

B. +2

C. -1

D. -2

Group no. = Sum of valence electrons

1A																	8A
H	2A											3A	4A	5A	6A	7A	He
Li	Be											B	C	N	O	F	Ne
Na	Mg	3B	4B	5B	6B	7B	8B			1B	2B	Al	Si	P	S	Cl	Ar
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe
Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn
Fr	Ra	Ac															

Metals

Metalloids

Nonmetals

Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu
Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr

Oxidation no. of metal = Group No.

Oxidation no. of nonmetal = Group No. - 8

Q 2. Group 7A in periodic table, in their compounds, always have an oxidation state of ....

A. +1

B. +2

C. -1

D. -2

Group no. = Sum of valence electrons

Oxidation no. of metal = Group No.

Oxidation no. of nonmetal = Group No. - 8

Q 3. The resulting bond due to transfer of electron is .....

A. Covalent.

B. Ionic.

C. Metallic.

D. None.

Ionic bond = transfer of e⁻ form metal to nonmetal

Covalent bond = sharing of e⁻ₛ between two nonmetals

Q 4. **Polar covalent bond is usually formed by unequal sharing of electrons between ....**

A. Two metals.

B. Metal and nonmetal.

C. Two nonmetals.

D. None.

Q 5. ……… **formula shows the simplest whole-number ratio of atoms of each element in the compound.**

A. Molecular.
B. Empirical.
C. Structural.
D. Ball-stick

Q 6. 105 g MgCl$_2$ contain ……… mol. (Mg = 24.3, Cl = 35.5).

A. 105.

B. 6.62 x 10^{23}.

C. 1.10.

D. 1.76.

Hint

$$Moles = \frac{Mass}{Molar\ mass}$$

Molar mass (MgCl$_2$) = 24.3 + 2(35.5) = 95.3

$$moles = \frac{Mass}{Molar\ mass} = \frac{105}{95.3} = 1.10$$

Q 7. The correct name of MnO is ………. .

A. Manganese oxide.

B. Manganese (I) oxide.

C. Manganese (II) oxide.

D. Manganese (III) oxide.

Mn (B elements)

1A													3A	4A	5A	6A	7A	8A
H	2A																	He
Li	Be												B	C	N	O	F	Ne
Na	Mg	3B	4B	5B	6B	7B		8B		1B	2B	Al	Si	P	S	Cl	Ar
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe
Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn
Fr	Ra	Ac															

Metals
Metalloids
Nonmetals

Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu
Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr

Name of metal + Charge

From O^{2-}

∴ Mn^{2+}

Q 8. The correct name for FeS is ....

A. iron (II) sulfate.
B. iron(III) sulfide.
C. iron (II) sulfide.
D. ferric sulfide.

Hint

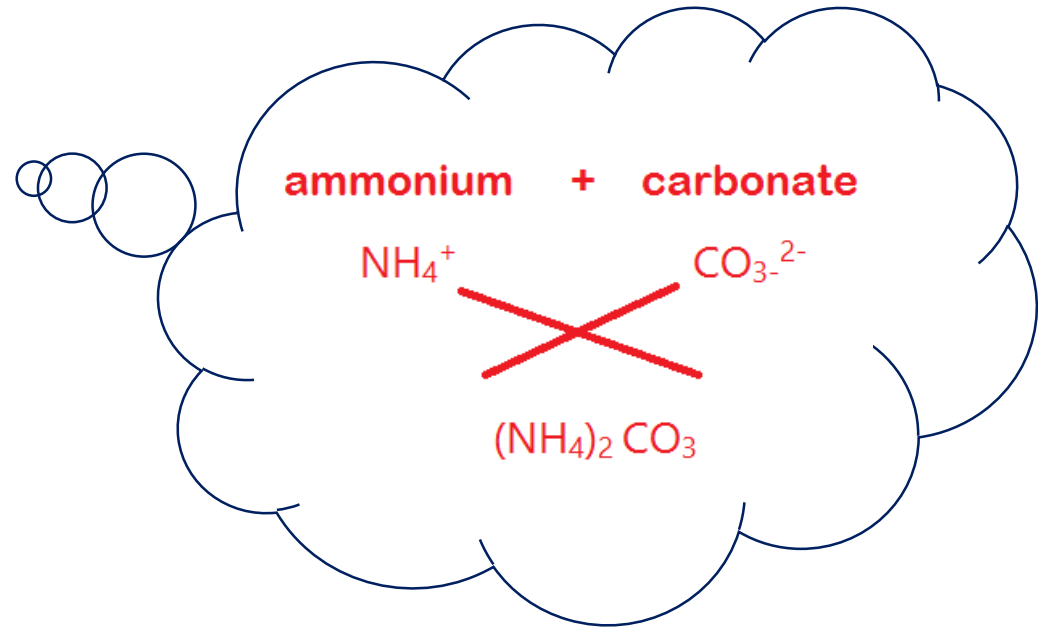Fe : Group B (transition elements).
Fe(II) = ferrous
Fe(III) = ferric

Q 9. **The formula for magnesium sulfate is ………. .**

A. $MgSO_3$.

B. $MgSO_4$.

C. $Mg(SO_4)_2$.

D. Mg_2SO_4.

magnesium + sulfate

Mg

Group 2A

$\therefore Mg^{2+}$

SO_4^{--}
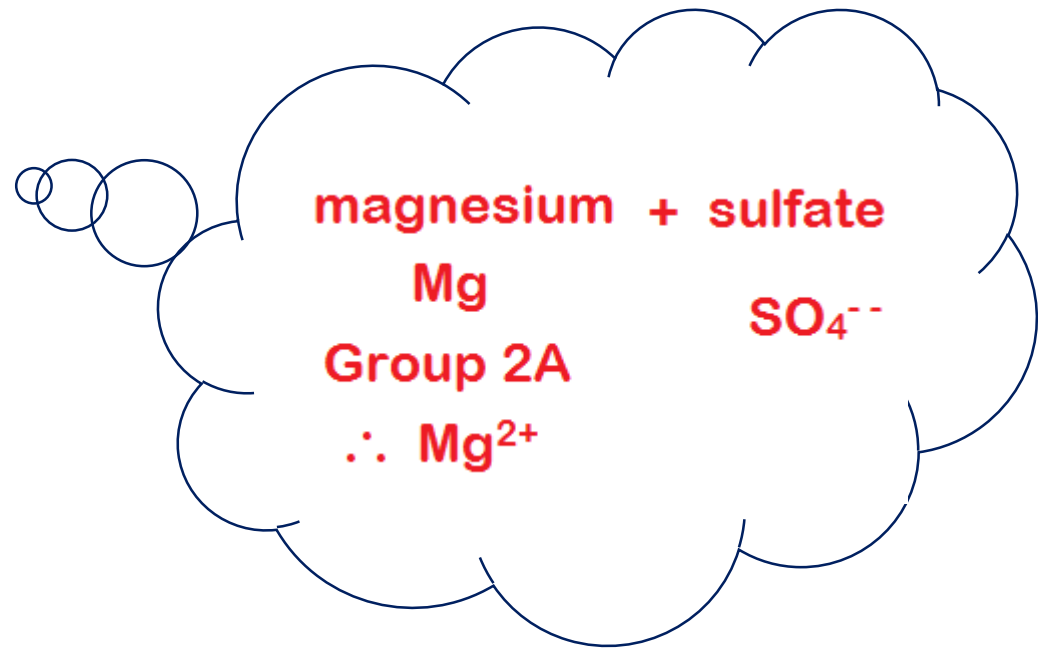
Q 10. **The formula of ammonium carbonate is ………… .**

A. NH_4CO_3.

B. $(NH_4)_2CO_3$.

C. $NH_4(CO_3)_2$.

D. None.

ammonium   +   carbonate

NH_4^+ CO_{3-}^{2-}

$(NH_4)_2\,CO_3$

Q 11. **The name of P_2O_5 is ………. .**

A. Phosphorous oxide.

B. Phosphorous pentoxide.

C. Diphosphorous pentoxide.

D. Diphosphorous oxide.

P2 O5

diphosphorous pentoxide

Q 12. Calculate the mass percent composition of carbon in $Al_2(CO_3)_3$.   [Al = 27, C = 12, O = 16]

A. 10.51.

B. 15.38.

C. 23.07.

D. 51.04.

$Al_2(CO_3)_3$

$$\text{Mass\% (C)} = \frac{\text{Mass of C}}{\text{Molar Mass}} \times 100$$

Molar mass = 2 (27) + 3 [1(12) + 3(16)] = 234

Mass of C = 3 x 12 = 36

$$\text{Mass\% (C)} = \frac{36}{234} \times 100 = 15.38\%$$

Q 13. The empirical formula for a compound that has 25.93% N and 74.07% O by mass is ………. .

A. NO_2.

B. N_2O_5.

C. N_4O_9.

D. N_2O_4.

	N	:	O
1. Percent:	25.93		74.07
2. Mass:	25.93		74.07
3. Mole:	$\dfrac{25.93}{14}$		$\dfrac{74.07}{16}$
	1.85		4.63
4. Divide by smallest no.	$\dfrac{1.85}{1.85}$		$\dfrac{4.63}{1.85}$
	1		2.5
5. Multiply by 2 : (Simplest whole number ratio)	2		5

∴ Empirical Formula : N_2O_5

Q 14. The molecular formula of a compound that has a molar mass of 180 g/mol and an empirical formula of CH_2O.

A. CH_2O.
B. $C_6H_{12}O_6$.
C. $C_3H_4O_3$.
D. None.

Molecular formula = Empirical formula x n
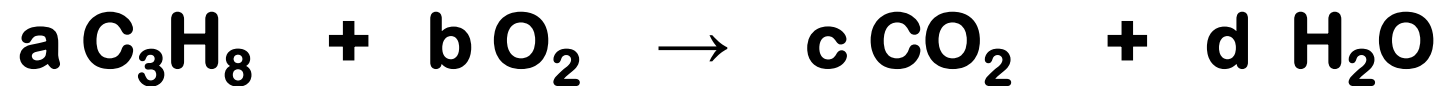
$$n = \frac{\text{Molar mass}}{\text{Mass of Empirical}}$$

Mass of Empirical = 1(12) + 2(1) + 1(16) = 30
(CH_2O)

$$n = \frac{180}{30} = 6$$

Molecular formula = (CH_2O) x 6

∴ Molecular formula: $C_6 H_{12} O_6$

Q 15. The coefficients (a, b, c, d) needed to balance the chemical equation

$$a\ C_3H_8\ +\ b\ O_2\ \rightarrow\ c\ CO_2\ +\ d\ H_2O$$

A. 1, 3, 3, 4.

B. 1, 5, 3, 4.

C. 1, 5, 4, 3.
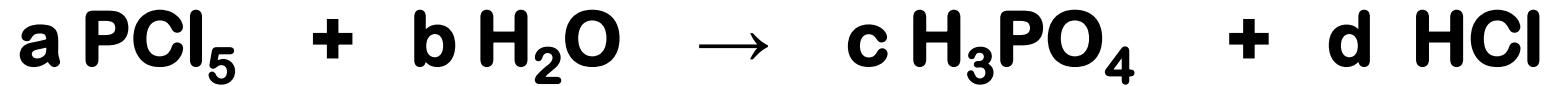
D. 1, 5, 3, 5.

Hint

Balanced equation:
Contains same no. of each kind of atoms on both sides of the equation.

Q 16. **The coefficients (a, b, c, d) that make the following equation is balanced are ....**

$$a \ PCl_5 \ + \ b \ H_2O \ \rightarrow \ c \ H_3PO_4 \ + \ d \ HCl$$

A. 2, 4, 2, 6.

B. 1, 3, 1, 5.

C. 1, 4, 1, 5.

D. 2, 8, 2, 10.

GOOD JOB!

With my best wishes

Khaled Khalil