

Date 11/3/14

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Section _____

Team _____

Instructor _____

Pre-Lab Study Questions

1. Where are the valence electrons in an atom?

In the outermost shell.

good answers, mostly correct

2. How are positive and negative ions formed?

They are formed when an atom takes an electron from another atom. The atom with less electron is the positive ion, the electron with more electrons are negative ions?

3. How do subscripts represent the charge balance of ions?

The subscripts represents how much of each element is required to balance the charge of the atom out.

4. Why are electrons shared in covalent compounds?

Electrons are shared in covalent compounds because the electronegativity

Electron-Dot Structure	Loss or Gain of Electrons	Electron Arrangement of Ion	Ionic Charge	Symbol of Ion	Name of Ion
Na \cdot	lose $1e^{-}$	2-8	1+	Na $^{+}$	sodium ion
$\cdot\ddot{N}\cdot$	gain $3e^{-}$	2-8 $^{-}$	3 $^{-}$	N $^{3-}$	nitride ion
Al \cdot	lose $3e^{-}$	2-8	3+	Al $^{3+}$	aluminium ion
$\cdot\ddot{Cl}\cdot$	gain $1e^{-}$	2-8-8	1 $^{-}$	Cl $^{-}$	chloride ion
Ca \cdot	lose $2e^{-}$	2-8-8	2+	Ca $^{2+}$	Calcium ion
$\cdot\ddot{O}\cdot$	gain $2e^{-}$	2-8	2 $^{-}$	O $^{2-}$	oxide ion

try putting the correct charges of the electrons

dot diagrams are correct

B.2 Formulas of ionic compounds

Name	Positive Ion ^{cation}	Negative Ion ^{anion}	Formula
Sodium chloride	Na^+	Cl^-	NaCl
Magnesium chloride	Mg^{2+}	Cl^-	MgCl_2
Calcium oxide	Ca^{2+}	O^{2-}	CaO
⁺¹ ⁻³ Lithium phosphide	Li^+	P^{3-}	Li_3P
⁺³ ⁻² Aluminum sulfide	Al^{3+}	S^{2-}	Al_2S_3
⁺² ⁻³ Calcium nitride	Ca^{2+}	N^{3-}	Ca_3N_2

B.3 Names of ionic compounds

nice job writing cation/anion on the top to indicate which ones are which

C.3 Names of ionic compounds

Cu_2S	Copper(I) sulfide
Fe_2O_3	Iron(III) oxide
CuCl_2	Copper(II) chloride
FeS	Iron sulfide
Ag_2O	Silver oxide
FeBr_2	Iron(II) bromide

D.2 Formulas of ionic compounds

Name	Positive Ion	Negative Ion	Formula
Potassium carbonate	K^+	CO_3^{2-}	K_2CO_3
Sodium nitrate	Na^+	NO_3^-	$NaNO_3$
Calcium bicarbonate	Ca^{2+}	HCO_3^-	$Ca(HCO_3)_2$
Aluminum hydroxide	Al^{3+}	OH^-	$Al(OH)_3$
Lithium phosphate	Li^+	PO_4^{3-}	Li_3PO_4
Potassium sulfate	K^+	SO_4^{2-}	K_2SO_4

D.3 Names of ionic compounds

$CaSO_4$	Calcium sulfate
$Al(NO_3)_3$	Aluminum Nitrate
Na_2CO_3	Sodium carbonate
$MgSO_3$	Magnesium sulfate
$Cu(OH)_2$	Copper hydroxide
$Mg_3(PO_4)_2$	Magnesium phosphate

Laboratory 7

Report Sheet - Lab 7

E.2 Physical properties

Compound	Appearance	Density	Melting Point

E.3 Electron-dot structures

Overall answers are correct and the packet is fully complete

Compound	Electron-Dot Structure	Name
H ₂ O	$ \begin{array}{c} \cdot\cdot \\ \text{H} : \text{O} : \\ \cdot\cdot \\ \text{H} \end{array} $	Dihydrogen monoxide
SBr ₂	$ \begin{array}{c} \cdot\cdot \\ \text{Br} : \text{S} : \text{Br} \\ \cdot\cdot \end{array} $	Sulfur bromide
PCl ₃	$ \begin{array}{c} \cdot\cdot \quad \cdot\cdot \quad \cdot\cdot \\ : \text{Cl} : \text{P} : \text{Cl} : \\ \cdot\cdot \quad \cdot\cdot \quad \cdot\cdot \\ \cdot\cdot \\ : \text{Cl} : \\ \cdot\cdot \end{array} $	phosphorus trichloride
CBr ₄	$ \begin{array}{c} \cdot\cdot \\ : \text{Br} : \\ \cdot\cdot \\ : \text{Br} : \text{C} : \text{Br} : \\ \cdot\cdot \quad \cdot\cdot \quad \cdot\cdot \\ : \text{Br} : \\ \cdot\cdot \end{array} $	Carbon tetrabromide
SO ₃	$ \begin{array}{c} \cdot\cdot \\ \cdot\cdot \\ \cdot\cdot \\ \text{O} : \text{S} : \text{O} \\ \cdot\cdot \quad \cdot\cdot \\ \cdot\cdot \\ \cdot\cdot \end{array} $	Sulfur trioxide

F. Electron Dot Structures and Molecular Shape

Formula	1. Electron dot Structure	2. Total number of electron groups	3. Electron geometry	4. Bond angle	5. Number of bonded atoms	6. Molecular geometry	7. Polar or nonpolar?
H ₂ O	$\begin{array}{c} \cdot\cdot \\ \text{H}:\ddot{\text{O}}: \\ \cdot\cdot \\ \text{H} \end{array}$	6	tetrahedral	105	2	bent	polar
SBr ₂	$\begin{array}{c} \cdot\cdot \\ \cdot\cdot \\ \text{Br}:\text{S}:\text{Br} \\ \cdot\cdot \\ \cdot\cdot \end{array}$	4	tetrahedral	105	3	bent	polar
NCl ₃	$\begin{array}{c} \cdot\cdot \\ \cdot\cdot \\ \text{Cl}:\text{N}:\text{Cl} \\ \cdot\cdot \\ \cdot\cdot \\ \text{Cl} \end{array}$	4	tetrahedral	107.5	4	trigonal pyramid	polar
CBr ₄	$\begin{array}{c} \cdot\cdot \\ \cdot\cdot \\ \text{Br}:\text{C}:\text{Br} \\ \cdot\cdot \\ \cdot\cdot \\ \text{Br} \end{array}$	4	tetrahedral	109	5	tetrahedral	non polar
SO ₃	$\begin{array}{c} \cdot\cdot \\ \cdot\cdot \\ \text{O}:\text{S}:\text{O} \\ \cdot\cdot \\ \cdot\cdot \\ \text{O} \end{array}$	3	trigonal polar	120	4	trigonal plane	polar
CO ₂	$\text{O}:\text{C}:\text{O}$	2	linear	180	3	linear	polar
NO ₃ ⁻	$\begin{array}{c} \cdot\cdot \\ \cdot\cdot \\ \text{O}:\text{N}:\text{O} \\ \cdot\cdot \\ \cdot\cdot \\ \text{O} \end{array}$	4	tetrahedral	107.5	4	trigonal pyramid	polar
CHCl ₃	$\begin{array}{c} \text{Cl} \\ \text{H}:\text{C}:\text{Cl} \\ \cdot\cdot \\ \text{Cl} \end{array}$	4	tetrahedral	109	5	tetrahedral	non polar