

UNIT 9 PRACTICE TEST

Name KEY

Multiple Choice Questions

- Ionic bonds are normally formed when
 - electrons are shared between a metal and a nonmetal
 - electrons are shared between two nonmetals
 - electrons are transferred from a metal to a nonmetal
 - electrons are transferred from a nonmetal to a metal
- Covalent bonds are normally formed when
 - electrons are shared between a metal and a nonmetal
 - electrons are shared between two nonmetals
 - electrons are transferred from a metal to a nonmetal
 - electrons are transferred from a nonmetal to a metal
- Which of these compounds is classified as IONIC?
 - CO₂
 - SF₂
 - ZnCl₂
 - SeBr₂
- Which of these compounds is classified as COVALENT?
 - PF₃
 - GaCl₃
 - NiBr₃
 - CrO₃
- Which of these compounds requires a Roman numeral in its name?
 - SF₆
 - ZnO
 - AlBr₃
 - PdCl₂
- The correct formula for strontium phosphide is
 - Sr₂P₃
 - Sr₃P₂
 - SrPO₄
 - Sr₃(PO₄)₂
- The correct formula for aluminum sulfide is
 - Al₂S₃
 - Al₃S₂
 - AlSO₄
 - Al₂(SO₄)₃
- The correct formula for calcium hydroxide is
 - CaO
 - CaH₂
 - CaOH₂
 - Ca(OH)₂
- The correct name for Na₃N is
 - sodium nitride
 - trisodium mononitride
 - sodium(III) nitride
 - sodium nitrate
- The correct name for CaCl₂ is
 - calcium(II) chloride
 - calcium chloride
 - calcium dichloride
 - calcium chlorate
- The correct formula for sodium carbonate is
 - Na₄C
 - NaCO₃
 - Na₂CO₃
 - Na₃CO₃
- The correct name for Mg(NO₃)₂ is
 - magnesium nitride
 - magnesium nitrate
 - magnesium dinitrate
 - magnesium(II) nitrate
- The correct name for CuCrO₄ is
 - copper chromate
 - copper(II) chromate
 - copper chromate(II)
 - copper chromium tetroxide
- The correct formula for dinitrogen trioxide is
 - N₂O
 - N₂O₃
 - N₂O₄
 - N₃O₂
- The correct name for SF₄ is
 - sulfur(IV) fluoride
 - sulfur fluoride(IV)
 - sulfur trifluoride
 - sulfur tetrafluoride

Short Answer Questions

1. Calculate the percent composition of caffeine, $C_8H_{10}N_4O_2$. Show your calculations to receive full credit.

49.57 % carbon

5.20 % hydrogen

28.85 % nitrogen

16.48 % oxygen

2. Fill in the empirical formulas for each covalent compound below.

Molecular Formula	Empirical Formula	Molecular Formula	Empirical Formula
$C_{16}H_{12}O_4$	C_4H_3O	$C_{14}H_{20}O_2$	$C_7H_{10}O$
$Na_2S_4O_6$	NaS_2O_3	$K_2C_4H_4O_6$	$KC_2H_2O_3$

3. How many grams are in 5.66 moles of calcium carbonate?

567 grams

4. A sample of sodium sulfate has a mass of 14.5 g. Calculate the number of sodium sulfate molecules present in the sample.

6.15×10^{22} molecules

5. A substance with an empirical formula of CH_2 has a molar mass of 84.18 g/mol. What is the molecular formula of this compound?

C_6H_{12}

6. A substance with an empirical formula of CF_3 has a molar mass of 138.02 g/mol. Determine the molecular formula of the compound and its name.

C_2F_6

7. Decide if the description represents IONIC bonding or COVALENT bonding

<u> C </u>	It is a non conductor of electricity, whether it exists as a solid, melted, or dissolved in water.
<u> I </u>	It is a nonelectrolyte in the solid form, but it can become a good conductor when melted or dissolved in water.
<u> C </u>	The building blocks of this type of compound are called molecules.
<u> I </u>	The electrons are transferred from one element to another to form this type of bond.
<u> C </u>	The electrons are shared in between elements in this type of bond.

8. Rank from ionic, covalent and metallic from strongest to weakest strength between molecules

Metallic > Ionic > Covalent

NAMING COMPOUNDS & WRITING CHEMICAL FORMULAS PRACTICE

I. Simple Binary Ionic Compounds:

- | | |
|---|--|
| 1. MgCl ₂ Magnesium Chloride | 1. Lithium oxide Li₂O |
| 2. NaI Sodium Iodide | 2. Barium fluoride BaF₂ |
| 3. Na ₂ S Sodium Sulfide | 3. Cesium sulfide Cs₂S |
| 4. Cs ₂ Se Cesium Selenide | 4. Beryllium oxide BeO |
| 5. Al ₂ S ₃ Aluminum Sulfide | 5. Strontium iodide SrI₂ |

II. Binary Ionic Compounds with Multi-Valent Metals:

- | | |
|---|---|
| 1. FeCl ₃ Iron (III) Chloride | 1. Chromium (IV) sulfide CrS₂ |
| 2. SnS ₂ Tin (IV) Sulfide | 2. Cobalt (II) bromide CoBr₂ |
| 3. Ti ₂ O ₃ Titanium (III) oxide | 3. Nickel (III) phosphide NiP |
| 4. PbF ₂ Lead (II) Fluoride | 4. Gold (I) nitride Au₃N |
| 5. PtSe ₂ Platinum (IV) Selenide | 5. Iron (II) arsenide Fe₃As₂ |

III. Ionic Compounds with Polyatomic Ions:

- | | |
|---|--|
| 1. NaCH_3COO Sodium Acetate | 1. Silver nitrite AgNO_2 |
| 2. ZnCO_3 Zinc Carbonat | 2. Ammonium hydroxide NH_4OH |
| 3. $\text{Al}(\text{NO}_3)_3$ Aluminum Nitrate | 3. Magnesium Phosphite $\text{Mg}_3(\text{PO}_3)_2$ |
| 4. KNO_3 Potassium nitrate | 4. Lead (IV) nitrate $\text{Pb}(\text{NO}_3)_4$ |
| 5. $\text{Zn}_3(\text{PO}_4)_2$ Zinc (II) Phosphate | 5. Iron (III) carbonate $\text{Fe}_2(\text{CO}_3)_3$ |

IV. Covalent Compounds:

- | | |
|--|--|
| 1. SF_6 Sulfur Hexafluoride | 1. Nitrogen monoxide NO |
| 2. P_2O_5 Diphosphorous pentaoxide | 2. Carbon dioxide CO_2 |
| 3. SiO_4 Silicon tetraoxide | 3. Bromine trioxide BrO_3 |
| 4. NO_2 Nitrogen dioxide | 4. Xenon hexafluoride XeF_6 |
| 5. H_2O Dihydrogen monoxide | 5. Difluorine disulfide F_2S_2 |

V. Acids:

- | | |
|--|--|
| 1. H_2CO_3 Carbonic Acid | 1. Hydrobromic acid HBr |
| 2. HClO_2 Chlorous Acid | 2. Acetic acid $\text{HC}_2\text{H}_3\text{O}_2$ |
| 3. HF Hydrofluoric Acid | 3. Oxalic acid $\text{H}_2\text{C}_2\text{O}_4$ |
| 4. H_3PO_4 Phosphoric Acid | 4. Bromous acid HBrO_2 |
| 5. HIO_4 Periodic Acid | 5. Hydrosulfuric acid H_2S |