

Name _____

Moles, and Formulas, and Compounds Test

This is an open-note, take-home test. Use what resources you need other than having others give you the answers. These are problems you must work. Show your work here or on attached papers.

Moles and Molar Solutions

1. How many molecules in a mole? _____
2. Who discovered / named the mole? _____
3. What is the weight of one mole of silver (Ag, #47) _____
4. What is the weight of one mole of water (H₂O) _____
5. What is the weight of one mole of Iron (Fe #26) _____
6. What is the weight of one mole of ethanol (C₂H₆O) _____
7. What is the generic formula to make a 1M (1 molar) solution of any substance?

8. Explain how to make a 1M potassium salt solution (KCl). Be specific on measurements.

9. Explain how to make a 5M solution of potassium salt (KCl). Again, be specific.

Elements, Compounds, and Mixtures

10. Label each of these as an element, compound, or mixture (E C or M) (9 points)

_____ silver coin (Ag)	_____ fruit salad	_____ battery acid (H ₂ SO ₄)
_____ calcium hydroxide (CaOH)	_____ contents of a locker	_____ glass (SiO ₂)
_____ platinum ring (Pt)	_____ chlorine gas (Cl)	_____ slice of pizza

Percent By Mass of an Element

11. Calculate the percent by mass of the following: (9 points)

Bleach (NaClO)	Marble (CaCO ₃)	Vinegar (C ₂ H ₄ O ₂)
_____ Na	_____ Ca	_____ C
_____ Cl	_____ C	_____ H
_____ O	_____ O	_____ O

Mass of a Mole

12. Determine how much a mole of each of these weigh in grams. (6 points)

One mole of antifreeze ($C_2H_6O_2$)

One mole of NutraSweet ($C_{14}H_{18}N_2O_5$)

One mole of chalk ($CaCO_3$)

One mole of Liquid Paper, a.k.a. White Out (TiO_2)

One mole of Teflon (C_2F_4)

FIVE moles of Windex (NH_3)

13. Carbon monoxide has the formula CO. If you have 140g of CO, how many moles is this?

14. How many moles are in 204.575g of table salt (NaCl)? Round to the tenth of a mole.

Definitions: Matching

Match the term with the definition, or the term with the example. Please use a letter, not lines.

_____ 15. Carbon ring

_____ 16. Carbon molecule with double bond

_____ 17. Positively charged ion

_____ 18. Carbon molecule with a triple bond

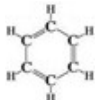
_____ 19. Carbon molecule with only single bonds

_____ 20. Negatively charged ion

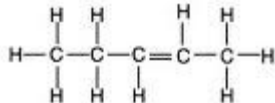
_____ 21. NH_3^+

_____ 22. $CH_3C\equiv CH$

_____ 23. $CH_3CH_2CH_2CH_3$

_____ 24. 

_____ 25. CH_3COO^-

_____ 26. 

A. anion

B. cation

C. alkane

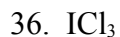
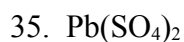
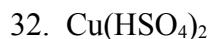
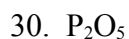
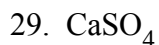
D. alkene

E. alkyne

F. benzene

Naming Compounds

Use a key to determine the names of the following compounds



Empirical Formulas From Percents

(percent to grams, grams to moles, divide by small, multiply 'till whole)

37. What's the empirical formula of a molecule containing 18.7% lithium, 16.3% carbon, and 65.0% oxygen?

38. The compound benzamide has the following percent composition. What is the empirical formula? C = 69.40 % H = 5.825 % O = 13.21 % N = 11.57 %

39. What is the formula for a compound containing 92.24% C and 7.76% H?

40. What is the empirical formula for a compound with 36.48% Na, 25.44% S and 38.08% O

41. Write the formula: 49.99% C, 5.61% H and 44.40% O

42. Last of these! What is 38.76% Ca, 19.97% P and 41.27% O?

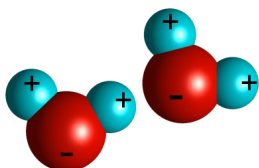
Match the following pictures to the correct formula:

43.



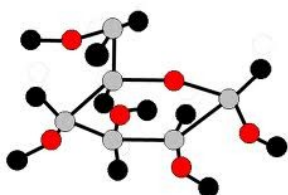
Acetic Acid (CH_3COOH)
Buckminsterfullerine or "Bucky Balls" (C_{60})
Carbon dioxide
Ethylene (C_2H_4)
Glucose ($\text{C}_6\text{H}_{12}\text{O}_6$)

44.

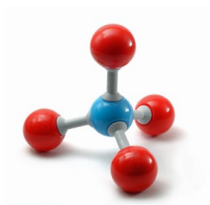


Methane (CH_4)
Octane (C_8H_{18})
Water

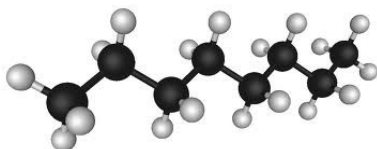
45.



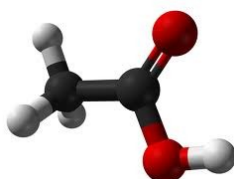
46.



47.



48.



49.



50.

