

Name: _____

Unit 2 Compounds, Test 3.1

Multiple Choice

- ___ 1. Elements that are hard, brittle, non-ductile, and non conductors of electricity are (1) metals and are located on the left side of the periodic chart; (2) metals and are located on the right side of the chart; (3) nonmetals and are located on the left side of the chart; (4) nonmetals and are located on the right side of the chart; (5) metalloids and are located on the left side of the chart.
- ___ 2. Atoms gain and lose electrons in chemical reactions to get a “magic number” of electrons on the outside. This can be thought of as the “driving force” for some chemical reactions. The most common “magic number” is (1) 2; (2) 4; (3) 6; (4) 8; (5) 10.
- ___ 3. Elements with the properties of both metals and nonmetals are called (1) rare earths; (2) metalloids; (3) lanthanides; (4) trans-uranium elements (5) synthetic elements.
- ___ 4. Which of the following is not an example of a binary compound (1) copper (I) sulfate; (2) copper (I) sulfide; (3) copper (II) sulfide; (4) barium oxide.
- ___ 5. Go to one of the lab tables and examine the substances there. Which one is a homogeneous mixture? (1) substance A; (2) substance B; (3) substance C; (4) substance D; (5) no homogeneous mixture is present
- ___ 6. Sodium chloride, is a compound which has been investigated thoroughly. Which of the following would not have been found to be true? (1) sodium and chlorine could be separated from each other by distillation; (2) sodium chloride has properties different from sodium and chlorine; (3) sodium and chlorine combine in an exact ratio; (4) it can be decomposed by electrolysis.
- ___ 7. Which of the following is a good example of a mixture? (1) KClO_4 ; (2) sulfur; (3) water; (4) gunpowder.
- ___ 8. Substance C was found to be a pure substance that could not be separated by distillation, chromatography, or any other physical process. Substance C is therefore (1) an element; (2) a compound; (3) a mixture; (4) either an element or a compound; (5) none of the above.
- ___ 9. A physical change would be (1) any change that does not result in new substances produced with new or different properties; (2) any change that does result in new substances produced with new or different properties; (3) none of the above.

- ___ 10. The activation energy is (1) the energy needed to stop a chemical reaction; (2) the energy needed to start a chemical reaction; (3) the energy given off in a chemical reaction; (4) the energy absorbed in a chemical reaction.
- ___ 11. The difference between empirical formulas and molecular formulas is (1) empirical formulas give the exact composition of a molecule while molecular formulas do not; (2) molecular formulas give the exact composition of a molecule while empirical formulas do not; (3) empirical formulas are used to describe all carbon containing compounds; (4) molecular formulas show the position of the atoms in space while empirical formulas do not; (5) empirical formulas show the position of the atoms in space while molecular formulas do not; (1,2) both 2 and 5.
- ___ 12. Which of the following would be an anion? (1) Ca^{2+} ; (2) S^{2-} ; (3) Ca; (4) S; (5) both 1 and 3; (1,2) both 2 and 4; (1,3) both 1 and 2; (1,4) none of the above.
- ___ 13. The difference between endothermic and exothermic processes is that (1) exothermic processes involve the absorption of energy while endothermic processes involve the emission of energy; (2) endothermic processes involve the absorption of water while exothermic processes involve the emission of water; (3) exothermic processes involve the absorption of water while exothermic processes involve the emission of water; (4) endothermic processes involve the absorption of energy while exothermic processes involve the emission of energy
- ___ 14. When raw milk is first obtained from Elsie it will separate into two distinct layers upon standing. In this case it is clearly a mixture. However, Elsie's son, Boulagard, likes it homogenized. (**Homogenization is a process whereby the large fat globules, which consist of many molecules associated together are subdivided into smaller globules so they will remain in solution.**) After homogenization is Boulagard drinking a (1) compound; (2) mixture; (3) an element?
- ___ 15. Which of the following sets of coefficients will correctly balance:
 $\text{HfCl}_3 + \text{Al} \rightarrow \text{HfCl}_2 + \text{AlCl}_3$
 (1) 3 1 3 1; (2) 1 3 1 3; (3) 2 2 1 3; (4) 4 1 2 4; (5) 1 1 1 2; (1,2) 1 3 3 3; (1,3) none of the above.
- ___ 16. Which of the following sets of coefficients will correctly balance:
 $\text{C}_{51}\text{H}_{98}\text{O}_6 + \text{O}_2 \rightarrow \text{CO}_2 + \text{H}_2\text{O}$
 (1) 3 1 3 1; (2) 2 3 134 110; (3) 3 2 134 110; (4) 40 110 40 55; (5) 110 110 110 220; (1,2) 160 3 0 3 0 30; (1,3) none of the above.
- ___ 17. Which of the following sets of coefficients will correctly balance:
 $\text{Mg} + \text{HOH} \rightarrow \text{Mg}(\text{OH})_2 + \text{H}_2$
 (1) 3 1 3 1; (2) 1 3 1 3; (3) 2 2 1 3; (4) 4 1 2 4; (5) 1 1 1 2; (1,2) 1 2 1 1; (1,3) none of the above.
- ___ 18. Whenever two elements form more than one compound, the different masses of one element that combine with the same mass of the other element are in the ratio of small whole numbers. This is one of the principles that John Dalton used to make the bold proclamation that "atoms exist". It is known as (1) law of elements;

(2) law of constant composition; (3) law of nuclear quantum units; (4) law of multiple proportions.

- ___ 19. Which of the following elements is diatomic? (1) nitrogen, (2) helium, (3) krypton; (4) neon; (5) boron.
- ___ 20. The reaction that you will be balancing in Short Answer 2c is classified as (1) synthesis; (2) decomposition; (3) single replacement; (4) double replacement; (5) none of the above.
- ___ 21. The reaction that you will be balancing in Short Answer 2d is classified as (1) synthesis; (2) decomposition; (3) single replacement; (4) double replacement; (5) none of the above.

Matching I: Naming compounds by the IUC system

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|--|------------------------------|------------------------------|
| ___ 22. $\text{Sb}(\text{OH})_5$ | (1) ammonium dichromate | (1,4) vanadyl carbide |
| ___ 23. $(\text{NH}_4)_2\text{Cr}_2\text{O}_7$ | (2) antimony (III) hydroxide | (1,5) cobalt (III) silicate |
| ___ 24. CoSiO_3 | (3) tin (II) chloride | (2,3) tin (IV) chloride |
| ___ 25. $\text{Cd}(\text{IO})_2$ | (4) tin (IV) chlorate | (2,4) tin (I) chloride |
| ___ 26. $(\text{VO})_2\text{C}$ | (5) ammonium chromate | (2,5) antimony (V) hydroxide |
| ___ 27. SnCl_2 | (1,2) cadmium iodide | (3,4) cobalt (II) silicate |
| | (1,3) cadmium periodate | (3,5) no answer available |

Matching II: Writing formulas

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|-----------------------------------|---|------------------------------------|
| ___ 28. calcium phosphate | (1) Rb_2Se | (1,4) $\text{NiFe}(\text{CN})_6$ |
| ___ 29. rubidium selenide | (2) $\text{Ni}_4[\text{Fe}(\text{CN})_6]_3$ | (1,5) $\text{Ca}_3(\text{PO}_4)_2$ |
| ___ 30. lead (II) borate | (3) VOS | (2,3) V_2S_5 |
| ___ 31. nickel (III) ferrocyanide | (4) $\text{V}_2(\text{SO}_4)_5$ | (2,4) Ca_3P_2 |
| ___ 32. vanadium (V) sulfide | (5) PbBr_2 | (2,5) Rb_2SeO_4 |
| ___ 33. cobalt (III) molybdate | (1,2) $\text{Co}_2(\text{MoO}_4)_3$ | (3,4) UF_6 |
| | (1,3) CoMoO_4 | (3,5) no answer available |

Short Answer

1. Go to one of the lab tables and carry out the following experiment: mix 5 drops of substance A with 5 drops of substance B. Did a chemical or physical process occur? Explain.

2. Complete and balance the following equations.
 - (a) aluminum + oxygen yields

 - (b) cobalt (III) sulfide yields

 - (c) zinc + silver chloride yields

 - (d) nickel sulfate + potassium phosphate

Extra Credit