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| 1. According to the law of definite proportions,   |  |  |  | | --- | --- | --- | |  | a. | the ratio of the masses of the elements in a compound is always the same. | |  | b. | it is not possible for the same two elements to form more than one compound. | |  | c. | if the same two elements form two different compounds, they do so in the same ratio. | |  | d. | the total mass after a chemical change is the same as before the change. |  |  |  | | --- | --- | | *ANSWER:* | a | | *POINTS:* | 1 | | *DIFFICULTY:* | easy | | *TOPICS:* | 2.2 | | *KEYWORDS:* | compound | general chemistry | general concepts | matter | |

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| 2. Which of the following pairs of compounds can be used to illustrate the law of multiple proportions?   |  |  |  | | --- | --- | --- | |  | a. | CaO and CaCl2 | |  | b. | NO and NO2 | |  | c. | H2S and HBr | |  | d. | SiH4 and SiO2 | |  | e. | NF3 and NCl3 |  |  |  | | --- | --- | | *ANSWER:* | b | | *POINTS:* | 1 | | *DIFFICULTY:* | easy | | *TOPICS:* | 2.2 | | *KEYWORDS:* | compound | general chemistry | general concepts | matter | |

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| 3. How many of the following did Dalton *not* discuss in his atomic theory?   |  |  | | --- | --- | | I. | isotopes | | II. | ions | | III. | protons | | IV. | neutrons | | V. | electrons |  |  |  |  | | --- | --- | --- | |  | a. | 2 | |  | b. | 5 | |  | c. | 4 | |  | d. | 1 | |  | e. | 3 |  |  |  | | --- | --- | | *ANSWER:* | b | | *POINTS:* | 1 | | *DIFFICULTY:* | easy | | *TOPICS:* | 2.3 | | *KEYWORDS:* | atomic theory of matter | Dalton's atomic theory | early atomic theory | general chemistry | |

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| 4. When 2.0 L of oxygen gas (O2) reacts with 1.0 L of nitrogen gas (N2), 2.0 L of gaseous product is formed. All volumes of gases are measured at the same temperature and pressure. What is the formula of the product?   |  |  |  | | --- | --- | --- | |  | a. | NO | |  | b. | NO4 | |  | c. | N2O3 | |  | d. | N2O | |  | e. | NO2 |  |  |  | | --- | --- | | *ANSWER:* | e | | *POINTS:* | 1 | | *DIFFICULTY:* | easy | | *TOPICS:* | 2.4 | | *KEYWORDS:* | chemical formula | chemical substance | early atomic theory | general chemistry | molecular substance | |

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| 5. Which one of the following statements about atomic structure is false?   |  |  |  | | --- | --- | --- | |  | a. | Almost all of the mass of the atom is concentrated in the nucleus. | |  | b. | The protons and neutrons in the nucleus are very tightly packed. | |  | c. | The number of protons and the number of neutrons are always the same in the neutral atom. | |  | d. | The electrons occupy a very large volume compared to the nucleus. |  |  |  | | --- | --- | | *ANSWER:* | c | | *POINTS:* | 1 | | *DIFFICULTY:* | easy | | *TOPICS:* | 2.4 2.5 | | *KEYWORDS:* | atomic theory of matter | early atomic theory | general chemistry | nuclear structure | |

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| 6. Which of the experiments listed below did *not* provide the information stated about the nature of the atom?   |  |  |  | | --- | --- | --- | |  | a. | The Rutherford experiment proved that the Thomson "plum pudding" model of the atom was essentially correct. | |  | b. | The Rutherford experiment determined the charge on the nucleus. | |  | c. | The cathode-ray tube proved that electrons have a negative charge. | |  | d. | Millikan's oil-drop experiment showed that the charge on any particle was a simple multiple of the charge on the electron. |  |  |  | | --- | --- | | *ANSWER:* | a | | *POINTS:* | 1 | | *DIFFICULTY:* | easy | | *TOPICS:* | 2.5 | | *KEYWORDS:* | atomic theory of matter | early atomic theory | general chemistry | structure of the atom | |

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| 7. Which of the following atomic symbols is incorrect?   |  |  |  | | --- | --- | --- | |  | a. | 3115P | |  | b. | 199F | |  | c. | 3417Cl | |  | d. | 3919K | |  | e. | 158C  ​ |  |  |  | | --- | --- | | *ANSWER:* | e | | *POINTS:* | 1 | | *DIFFICULTY:* | easy | | *TOPICS:* | 2.5 | | *KEYWORDS:* | atomic theory of matter | early atomic theory | general chemistry | isotope | |

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| 8. The element rhenium (Re) exists as two stable isotopes and 18 unstable isotopes. Rhenium-185 has in its nucleus   |  |  |  | | --- | --- | --- | |  | a. | 75 protons, 110 neutrons. | |  | b. | 75 protons, 75 neutrons. | |  | c. | 75 protons, 130 neutrons. | |  | d. | 130 protons, 75 neutrons. | |  | e. | not enough information is given. |  |  |  | | --- | --- | | *ANSWER:* | a | | *POINTS:* | 1 | | *DIFFICULTY:* | easy | | *TOPICS:* | 2.5 | | *KEYWORDS:* | atomic theory of matter | early atomic theory | general chemistry | isotope | |

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| 9. Which of the following statements is(are) true?   |  |  | | --- | --- | | I. | O and F have the same number of neutrons. | | II. | C and N are isotopes of each other because their mass numbers are the same. | | III. | O2– has the same number of electrons as Ne. |  |  |  |  | | --- | --- | --- | |  | a. | I only | |  | b. | II only | |  | c. | III only | |  | d. | I and II only | |  | e. | I and III only |  |  |  | | --- | --- | | *ANSWER:* | c | | *POINTS:* | 1 | | *DIFFICULTY:* | moderate | | *TOPICS:* | 2.5 | | *KEYWORDS:* | atomic theory of matter | early atomic theory | general chemistry | isotope | |

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| 10. ​​Which among the following represent a set of isotopes? Atomic nuclei containing I.    20 protons and 20 neutrons. II.   21 protons and 19 neutrons. III.  22 neutrons and 18 protons. IV.  20 protons and 22 neutrons. V.   21 protons and 20 neutrons.   |  |  |  | | --- | --- | --- | |  | a. | ​I, V | |  | b. | ​III, IV | |  | c. | ​I, II, III | |  | d. | ​I, IV and II, V | |  | e. | ​No isotopes are indicated. |  |  |  | | --- | --- | | *ANSWER:* | d | | *POINTS:* | 1 | | *DIFFICULTY:* | moderate | | *TOPICS:* | 2.5 | | *KEYWORDS:* | atomic theory of matter | early atomic theory | general chemistry | isotope | |

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| 11. How many protons, neutrons, and electrons does the atom 39K have?   |  |  |  | | --- | --- | --- | |  | a. | 20 protons, 19 neutrons, 20 electrons | |  | b. | 19 protons, 19 neutrons, 39 electrons | |  | c. | 20 protons, 20 neutrons, 19 electrons | |  | d. | 19 protons, 19 neutrons, 19 electrons | |  | e. | 19 protons, 20 neutrons, 19 electrons |  |  |  | | --- | --- | | *ANSWER:* | e | | *POINTS:* | 1 | | *DIFFICULTY:* | easy | | *TOPICS:* | 2.6 | | *KEYWORDS:* | atomic theory of matter | early atomic theory | general chemistry | isotope | |

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| 12. An ion is formed   |  |  | | --- | --- | | I. | by either adding protons to or subtracting protons from the atom. | | II. | by either adding electrons to or subtracting electrons from the atom. | | III. | by either adding neutrons to or subtracting neutrons from the atom. |  |  |  |  | | --- | --- | --- | |  | a. | Only I is true. | |  | b. | Only II is true. | |  | c. | Only III is true. | |  | d. | All of the statements are true. | |  | e. | Two of the statements are true. |  |  |  | | --- | --- | | *ANSWER:* | b | | *POINTS:* | 1 | | *DIFFICULTY:* | easy | | *TOPICS:* | 2.6 | | *KEYWORDS:* | chemical formula | chemical substance | early atomic theory | general chemistry | ionic substance | |

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| 13. Which is the symbol for the isotope of nitrogen that has 7 protons and 8 neutrons?   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. |  | |  | c. |  | |  | d. |  |  |  |  | | --- | --- | | *ANSWER:* | d | | *POINTS:* | 1 | | *DIFFICULTY:* | easy | | *TOPICS:* | 2.6 | | *KEYWORDS:* | atomic theory of matter | early atomic theory | general chemistry | isotope | |

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| 14. Which of the following represents a pair of isotopes?   |  |  |  | | --- | --- | --- | |  | a. | 157N, 158O | |  | b. | 11H, 21H | |  | c. | 147N, 158O | |  | d. | 3115P, 3115P3– | |  | e. | C, C60 |  |  |  | | --- | --- | | *ANSWER:* | b | | *POINTS:* | 1 | | *DIFFICULTY:* | easy | | *TOPICS:* | 2.6 2.7 | | *KEYWORDS:* | atomic theory of matter | early atomic theory | general chemistry | isotope | |

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| 15. Which of the following statements is(are) true?   |  |  | | --- | --- | | I. | The number of protons is the same for all neutral atoms of an element. | | II. | The number of electrons is the same for all neutral atoms of an element. | | III. | The number of neutrons is the same for all neutral atoms of an element. |  |  |  |  | | --- | --- | --- | |  | a. | I, II, and III are all true. | |  | b. | I, II, and III are all false. | |  | c. | Only I and II are true. | |  | d. | Only I and III are true. | |  | e. | Only II and III are true. |  |  |  | | --- | --- | | *ANSWER:* | c | | *POINTS:* | 1 | | *DIFFICULTY:* | easy | | *TOPICS:* | 2.6 2.7 | | *KEYWORDS:* | atomic theory of matter | early atomic theory | general chemistry | isotope | |

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| 16. The ion 14N3- has   |  |  |  | | --- | --- | --- | |  | a. | 7 protons, 7 neutrons, 4 electrons | |  | b. | 7 protons, 7 neutrons,3 electrons | |  | c. | 7 protons, 14 neutrons, 7 electrons | |  | d. | 7 protons, 7neutrons, 10 electrons | |  | e. | 7 protons, 7 neutrons, 7 electrons |  |  |  | | --- | --- | | *ANSWER:* | d | | *POINTS:* | 1 | | *DIFFICULTY:* | easy | | *TOPICS:* | 2.6 2.9 | | *KEYWORDS:* | chemical formula | chemical substance | early atomic theory | general chemistry | ionic substance | |

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| 17. The ion 127I– has   |  |  |  | | --- | --- | --- | |  | a. | 53 protons, 74 neutrons, 52 electrons | |  | b. | 53 protons, 74 neutrons, 54 electrons | |  | c. | 53 protons, 53 neutrons, 53 electrons | |  | d. | 53 protons, 74 neutrons, 53 electrons | |  | e. | 53 protons, 127 neutrons, 54 electrons |  |  |  | | --- | --- | | *ANSWER:* | b | | *POINTS:* | 1 | | *DIFFICULTY:* | easy | | *TOPICS:* | 2.6 2.9 | | *KEYWORDS:* | chemical formula | chemical substance | early atomic theory | general chemistry | ionic substance | |

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| 18. An element's most stable ion forms an ionic compound with chlorine having the formula XCl2. If the mass number of the ion is 89 and it has 36 electrons, what is the element and how many neutrons does it have?   |  |  |  | | --- | --- | --- | |  | a. | Sr, 51 neutrons | |  | b. | Kr, 55 neutrons | |  | c. | Se, 55 neutrons | |  | d. | Kr, 53 neutrons | |  | e. | Rb, 52 neutrons |  |  |  | | --- | --- | | *ANSWER:* | a | | *POINTS:* | 1 | | *DIFFICULTY:* | moderate | | *TOPICS:* | 2.6 2.9 | | *KEYWORDS:* | chemical formula | chemical substance | early atomic theory | general chemistry | ionic substance | |

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| 19. Which element does *not* belong to the family or classification indicated?   |  |  |  | | --- | --- | --- | |  | a. | Br, halogen | |  | b. | Na, alkali metal | |  | c. | As, lanthanides | |  | d. | He, noble gas | |  | e. | Ru, transition metal |  |  |  | | --- | --- | | *ANSWER:* | c | | *POINTS:* | 1 | | *DIFFICULTY:* | easy | | *TOPICS:* | 2.7 2.8 | | *KEYWORDS:* | early atomic theory | general chemistry | periodic table | |

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| 20. Which are alkaline earth halides?   |  |  |  | | --- | --- | --- | |  | a. | MgO, MgS, CaO | |  | b. | NaI, KBr, LiF | |  | c. | CaF2, MgBr2, SrI2 | |  | d. | Al2O3, In2O3, Ga2S3 | |  | e. | PbI2, PbBr2, CdF2 |  |  |  | | --- | --- | | *ANSWER:* | c | | *POINTS:* | 1 | | *DIFFICULTY:* | easy | | *TOPICS:* | 2.8 2.9 | | *KEYWORDS:* | early atomic theory | general chemistry | periodic table | |

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| 21. Select the group of symbols that would correctly complete the following statements, respectively.  \_\_\_ is the heaviest noble gas. \_\_\_ is the transition metal that has 24 electrons as a 3+ ion. \_\_\_ is the halogen in the third period. \_\_\_ is the alkaline earth metal that has 18 electrons as a stable ion.   |  |  |  | | --- | --- | --- | |  | a. | Rn, Cr, Br, Ca | |  | b. | Ra, Sc, Br, K | |  | c. | Ra, Co, Cl, K | |  | d. | Rn, Co, Cl, Ca |  |  |  | | --- | --- | | *ANSWER:* | d | | *POINTS:* | 1 | | *DIFFICULTY:* | moderate | | *TOPICS:* | 2.8 2.9 | | *KEYWORDS:* | early atomic theory | general chemistry | periodic table | |

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| 22. \_\_\_\_\_\_ form ions with a 2+ charge when they react with nonmetals.   |  |  |  | | --- | --- | --- | |  | a. | Halogens | |  | b. | Noble gases | |  | c. | Alkaline earth metals | |  | d. | Alkali metals | |  | e. | None of these choices |  |  |  | | --- | --- | | *ANSWER:* | c | | *POINTS:* | 1 | | *DIFFICULTY:* | easy | | *TOPICS:* | 2.8 | | *KEYWORDS:* | early atomic theory | general chemistry | group | periodic table | |

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| 23. Which of the following formulas is *not* correct?   |  |  |  | | --- | --- | --- | |  | a. | Ba(OH)2 | |  | b. | ​LiS | |  | c. | ​NaI | |  | d. | KCl | |  | e. | MgSO3 |  |  |  | | --- | --- | | *ANSWER:* | b | | *POINTS:* | 1 | | *DIFFICULTY:* | easy | | *TOPICS:* | 2.8 | | *KEYWORDS:* | chemical formula | chemical substance | early atomic theory | general chemistry | ionic substance | |

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| 24. Which of the following is *not* the correct chemical formula for the compound named?   |  |  |  | | --- | --- | --- | |  | a. | Fe2PO4             iron(II) phosphate | |  | b. | BaBr2             barium bromide | |  | c. | Li2O             lithium oxide | |  | d. | HF             hydrogen fluoride | |  | e. | Mg3N2          magnesiumnitride |  |  |  | | --- | --- | | *ANSWER:* | a | | *POINTS:* | 1 | | *DIFFICULTY:* | easy | | *TOPICS:* | 2.9 | | *KEYWORDS:* | chemical substance | early atomic theory | general chemistry | ionic compound | nomenclature of simple compound | |

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| 25. Which of the following is *not* the correct name for the formula given?   |  |  |  | | --- | --- | --- | |  | a. | HClO         hypochlorus acid | |  | b. | Cr2S3      chromium(III)sulfide | |  | c. | PCl5           phosphoruspentachloride | |  | d. | CoO             cobalt(II) oxide | |  | e. | CaSO3             calciumsulfate |  |  |  | | --- | --- | | *ANSWER:* | e | | *POINTS:* | 1 | | *DIFFICULTY:* | easy | | *TOPICS:* | 2.9 | | *KEYWORDS:* | chemical substance | early atomic theory | general chemistry | nomenclature of simple compound | |

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| 26. Which is *not* the correct chemical formula for the compound named?   |  |  |  | | --- | --- | --- | |  | a. | iron(II) oxide             FeO | |  | b. | potassium sulfate             K2SO4 | |  | c. | sodium sulfide             NaS | |  | d. | zinc nitrate             Zn(NO3)2 | |  | e. | calcium carbonate             CaCO3 |  |  |  | | --- | --- | | *ANSWER:* | c | | *POINTS:* | 1 | | *DIFFICULTY:* | easy | | *TOPICS:* | 2.9 | | *KEYWORDS:* | chemical substance | early atomic theory | general chemistry | ionic compound | nomenclature of simple compound | |

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| 27. What is the correct formula for barium phosphate?   |  |  |  | | --- | --- | --- | |  | a. | Ba2PO4 | |  | b. | Ba3(PO4)2 | |  | c. | Ba2(PO4)3 | |  | d. | Ba3PO4 | |  | e. | BaPO4 |  |  |  | | --- | --- | | *ANSWER:* | b | | *POINTS:* | 1 | | *DIFFICULTY:* | easy | | *TOPICS:* | 2.9 | | *KEYWORDS:* | chemical substance | early atomic theory | general chemistry | ionic compound | nomenclature of simple compound | |

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| 28. Which of the following is *not* the correct chemical formula for the compound named?   |  |  |  | | --- | --- | --- | |  | a. | HF             hydrogen fluoride | |  | b. | MgO             magnesium oxide | |  | c. | Fe3PO4             iron(III) phosphate | |  | d. | Li2O             lithium oxide | |  | e. | BaCl2             barium chloride |  |  |  | | --- | --- | | *ANSWER:* | c | | *POINTS:* | 1 | | *DIFFICULTY:* | easy | | *TOPICS:* | 2.9 | | *KEYWORDS:* | chemical substance | early atomic theory | general chemistry | nomenclature of simple compound | |

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| 29. Which formula is *not* correct?   |  |  |  | | --- | --- | --- | |  | a. | LiF | |  | b. | Ca(NO2)2 | |  | c. | ​AlCl2 | |  | d. | NaC2H3O2 | |  | e. | MgS |  |  |  | | --- | --- | | *ANSWER:* | c | | *POINTS:* | 1 | | *DIFFICULTY:* | easy | | *TOPICS:* | 2.9 | | *KEYWORDS:* | chemical formula | chemical substance | early atomic theory | general chemistry | ionic substance | |

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| 30. What is the correct formula for lead(IV) oxide?   |  |  |  | | --- | --- | --- | |  | a. | PbO4 | |  | b. | PbO3 | |  | c. | PbO | |  | d. | Pb4O | |  | e. | PbO2 |  |  |  | | --- | --- | | *ANSWER:* | e | | *POINTS:* | 1 | | *DIFFICULTY:* | moderate | | *TOPICS:* | 2.9 | | *KEYWORDS:* | chemical substance | early atomic theory | general chemistry | ionic compound | nomenclature of simple compound | |

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| 31. Which of the following is *not* the correct name for the formula given?   |  |  |  | | --- | --- | --- | |  | a. | PCl5             phosphorus pentachoride | |  | b. | Fe2O3             iron(III) oxide | |  | c. | HClO             hypochlorous acid | |  | d. | BaSO3             barium sulfate | |  | e. | CoO             cobalt(II) oxide |  |  |  | | --- | --- | | *ANSWER:* | d | | *POINTS:* | 1 | | *DIFFICULTY:* | easy | | *TOPICS:* | 2.9 | | *KEYWORDS:* | chemical substance | early atomic theory | general chemistry | ionic compound | nomenclature of simple compound | |

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| 32. Which of the following is *not* the correct chemical formula for the compound named?   |  |  |  | | --- | --- | --- | |  | a. | Na(OH)2             sodium hydroxide | |  | b. | Mg(C2H3O2)2             magnesium acetate | |  | c. | ZnS             zinc sulfide | |  | d. | Fe2O3             iron(III) oxide | |  | e. | KCN             potassium cyanide |  |  |  | | --- | --- | | *ANSWER:* | a | | *POINTS:* | 1 | | *DIFFICULTY:* | moderate | | *TOPICS:* | 2.9 | | *KEYWORDS:* | chemical substance | early atomic theory | general chemistry | ionic compound | nomenclature of simple compound | |

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| 33. Which is the correct formula for copper(I) oxide?   |  |  |  | | --- | --- | --- | |  | a. | CuO | |  | b. | CuO2 | |  | c. | Cu2O2 | |  | d. | Cu2O | |  | e. | Cu2O3 |  |  |  | | --- | --- | | *ANSWER:* | d | | *POINTS:* | 1 | | *DIFFICULTY:* | moderate | | *TOPICS:* | 2.9 | | *KEYWORDS:* | chemical substance | early atomic theory | general chemistry | ionic compound | nomenclature of simple compound | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 34. Complete the following table.   |  |  |  |  |  | | --- | --- | --- | --- | --- | | **Symbol** | **Number of Protons** | **Number of Neutrons** | **Number of Electrons** | **Net Charge** | |  |  |  |  |  | |  | 31 | 38 |  | 3+ | |  | 52 | 75 | 54 |  | |  |  | 29 |  | 2+ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | *ANSWER:* | ​   |  |  |  |  |  | | --- | --- | --- | --- | --- | | **Symbol** | **Number of Protons** | **Number of Neutrons** | **Number of Electrons** | **Net Charge** | |  | 82 | 124 | 82 | 0 | |  | 31 | 38 | 28 | 3+ | |  | 52 | 75 | 54 | 2– | |  | 25 | 29 | 23 | 2+ | | | *POINTS:* | 1 | | *DIFFICULTY:* | difficult | | *TOPICS:* | 2.6 2.7 | | *KEYWORDS:* | atomic theory of matter | early atomic theory | general chemistry | isotope | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| 35. Complete the following table.   |  |  |  | | --- | --- | --- | | **Symbol** | **56Fe2+** |  | | Number of protons |  | 35 | | Number of neutrons |  | 45 | | Number of electrons |  |  | | Atomic number |  |  | | Mass number |  |  | | Net charge |  | 1- |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | *ANSWER:* | |  |  |  | | --- | --- | --- | | **Symbol** | 56**Fe**2+ | **80Br-** | | Number of protons | 26 | 35 | | Number of neutrons | 30 | 45 | | Number of electrons | 24 | 36 | | Atomic number | 26 | 35 | | Mass number | 56 | 80 | | Net charge | 2+ | 1- | | | *POINTS:* | 1 | | *DIFFICULTY:* | difficult | | *TOPICS:* | 2.6 2.7 | | *KEYWORDS:* | atomic theory of matter | early atomic theory | general chemistry | isotope | |

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| --- |
| Name the following compounds: |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 36. Al2(SO4)3   |  |  | | --- | --- | | *ANSWER:* | aluminum sulfate | | *POINTS:* | 1 | | *DIFFICULTY:* | easy | | *TOPICS:* | 2.8 | | *KEYWORDS:* | chemical substance | early atomic theory | general chemistry | ionic compound | nomenclature of simple compound | |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 37. NH4NO3   |  |  | | --- | --- | | *ANSWER:* | ammonium nitrate | | *POINTS:* | 1 | | *DIFFICULTY:* | easy | | *TOPICS:* | 2.8 | | *KEYWORDS:* | chemical substance | early atomic theory | general chemistry | ionic compound | nomenclature of simple compound | |

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| 38. NaH   |  |  | | --- | --- | | *ANSWER:* | sodium hydride | | *POINTS:* | 1 | | *DIFFICULTY:* | easy | | *TOPICS:* | 2.8 | | *KEYWORDS:* | chemical substance | early atomic theory | general chemistry | ionic compound | nomenclature of simple compound | |

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| 39. K2Cr2O7   |  |  | | --- | --- | | *ANSWER:* | potassium dichromate | | *POINTS:* | 1 | | *DIFFICULTY:* | easy | | *TOPICS:* | 2.8 | | *KEYWORDS:* | chemical substance | early atomic theory | general chemistry | ionic compound | nomenclature of simple compound | |

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| 40. CCl4   |  |  | | --- | --- | | *ANSWER:* | carbon tetrachloride | | *POINTS:* | 1 | | *DIFFICULTY:* | easy | | *TOPICS:* | 2.8 | | *KEYWORDS:* | binary molecular compound | chemical substance | early atomic theory | general chemistry | nomenclature of simple compound | |

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| 41. AgCl   |  |  | | --- | --- | | *ANSWER:* | silver chloride | | *POINTS:* | 1 | | *DIFFICULTY:* | easy | | *TOPICS:* | 2.8 | | *KEYWORDS:* | chemical substance | early atomic theory | general chemistry | ionic compound | nomenclature of simple compound | |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 42. CaSO4   |  |  | | --- | --- | | *ANSWER:* | calcium sulfate | | *POINTS:* | 1 | | *DIFFICULTY:* | easy | | *TOPICS:* | 2.8 | | *KEYWORDS:* | chemical substance | early atomic theory | general chemistry | ionic compound | nomenclature of simple compound | |

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| 43. HNO3   |  |  | | --- | --- | | *ANSWER:* | nitric acid | | *POINTS:* | 1 | | *DIFFICULTY:* | easy | | *TOPICS:* | 2.8 | | *KEYWORDS:* | acid | chemical substance | early atomic theory | general chemistry | nomenclature of simple compound | |

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| 44. N2O3   |  |  | | --- | --- | | *ANSWER:* | dinitrogen trioxide | | *POINTS:* | 1 | | *DIFFICULTY:* | easy | | *TOPICS:* | 2.8 | | *KEYWORDS:* | binary molecular compound | chemical substance | early atomic theory | general chemistry | nomenclature of simple compound | |

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| 45. SnI2   |  |  | | --- | --- | | *ANSWER:* | tin(II) iodide | | *POINTS:* | 1 | | *DIFFICULTY:* | easy | | *TOPICS:* | 2.8 | | *KEYWORDS:* | chemical substance | early atomic theory | general chemistry | ionic compound | nomenclature of simple compound | |

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| Write the formula for: |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 46. sodium dichromate   |  |  | | --- | --- | | *ANSWER:* | Na2Cr2O7 | | *POINTS:* | 1 | | *DIFFICULTY:* | easy | | *TOPICS:* | 2.8 | | *KEYWORDS:* | chemical substance | early atomic theory | general chemistry | ionic compound | nomenclature of simple compound | |

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| 47. iron(III) oxide   |  |  | | --- | --- | | *ANSWER:* | Fe2O3 | | *POINTS:* | 1 | | *DIFFICULTY:* | easy | | *TOPICS:* | 2.8 | | *KEYWORDS:* | chemical substance | early atomic theory | general chemistry | ionic compound | nomenclature of simple compound | |

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| 48. dinitrogen trioxide   |  |  | | --- | --- | | *ANSWER:* | N2O3 | | *POINTS:* | 1 | | *DIFFICULTY:* | easy | | *TOPICS:* | 2.8 | | *KEYWORDS:* | binary molecular compound | chemical substance | early atomic theory | general chemistry | nomenclature of simple compound | |

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| 49. cobalt(II) chloride   |  |  | | --- | --- | | *ANSWER:* | CoCl2 | | *POINTS:* | 1 | | *DIFFICULTY:* | easy | | *TOPICS:* | 2.8 | | *KEYWORDS:* | chemical substance | early atomic theory | general chemistry | ionic compound | nomenclature of simple compound | |

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| 50. aluminum hydroxide   |  |  | | --- | --- | | *ANSWER:* | Al(OH)3 | | *POINTS:* | 1 | | *DIFFICULTY:* | easy | | *TOPICS:* | 2.8 | | *KEYWORDS:* | chemical substance | early atomic theory | general chemistry | ionic compound | nomenclature of simple compound | |

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| 51. hydrosulfuric acid   |  |  | | --- | --- | | *ANSWER:* | H2S | | *POINTS:* | 1 | | *DIFFICULTY:* | easy | | *TOPICS:* | 2.8 | | *KEYWORDS:* | acid | chemical substance | early atomic theory | general chemistry | nomenclature of simple compound | |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 52. sulfurous acid   |  |  | | --- | --- | | *ANSWER:* | H2SO3 | | *POINTS:* | 1 | | *DIFFICULTY:* | easy | | *TOPICS:* | 2.8 | | *KEYWORDS:* | acid | chemical substance | early atomic theory | general chemistry | nomenclature of simple compound | |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 53. nitric acid   |  |  | | --- | --- | | *ANSWER:* | HNO3 | | *POINTS:* | 1 | | *DIFFICULTY:* | easy | | *TOPICS:* | 2.8 | | *KEYWORDS:* | acid | chemical substance | early atomic theory | general chemistry | nomenclature of simple compound | |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 54. phosphoric acid   |  |  | | --- | --- | | *ANSWER:* | H3PO4 | | *POINTS:* | 1 | | *DIFFICULTY:* | easy | | *TOPICS:* | 2.8 | | *KEYWORDS:* | acid | chemical substance | early atomic theory | general chemistry | nomenclature of simple compound | |

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| 55. acetic acid   |  |  | | --- | --- | | *ANSWER:* | HC2H3O2 | | *POINTS:* | 1 | | *DIFFICULTY:* | easy | | *TOPICS:* | 2.8 | | *KEYWORDS:* | acid | chemical substance | early atomic theory | general chemistry | nomenclature of simple compound | |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 56. Write the chemical formulas for the following compounds or ions.   |  |  | | --- | --- | | a) nitrate ion | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | | b) aluminum oxide | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | | c) ammonium ion | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | | d) perchloric acid | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | | e) copper(II) bromide | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |  |  |  | | --- | --- | | *ANSWER:* | a) NO3–   b) Al2O3     c) NH4+     d) HClO4     e) CuBr2 | | *POINTS:* | 1 | | *DIFFICULTY:* | moderate | | *TOPICS:* | 2.9 | | *KEYWORDS:* | chemical substance | early atomic theory | general chemistry | nomenclature of simple compound | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 57. Write the names of the following compounds:   |  |  | | --- | --- | | a) FeSO4 | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | | b) NaC2H3O2 | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | | c) KNO2 | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | | d) Ca(OH)2 | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | | e) NiCO3 | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |  |  |  | | --- | --- | | *ANSWER:* | a) iron(II) sulfate     b) sodium acetate   c) potassium nitrite     d) calcium hydroxide     e) nickel(II) carbonate | | *POINTS:* | 1 | | *DIFFICULTY:* | moderate | | *TOPICS:* | 2.9 | | *KEYWORDS:* | chemical substance | early atomic theory | general chemistry | ionic compound | nomenclature of simple compound | |

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| 58. Which nuclide has more protons than neutrons?   |  |  |  | | --- | --- | --- | |  | a. | Fe | |  | b. | K | |  | c. | Co | |  | d. | Ni |  |  |  | | --- | --- | | *ANSWER:* | a | | *POINTS:* | 1 | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| 59. An isotope of an element is formed   |  |  | | --- | --- | | I. | by adding protons to, or removing protons from, the atom. | | II. | by adding neutrons to, or removing neutrons from, the atom. | | III. | by adding electrons to, or removing electrons from, the atom. |  |  |  |  | | --- | --- | --- | |  | a. | Only I is true | |  | b. | Only II is true | |  | c. | Only III is true | |  | d. | All of the statements are true | |  | e. | Two of the statements are true |  |  |  | | --- | --- | | *ANSWER:* | b | | *POINTS:* | 1 | |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 60. Which statement or statements regarding Antoine Lavoisier and his discovery of the conservation of mass in chemical reactions must be false.   |  |  |  | | --- | --- | --- | |  | a. | Lavoisier conducted his experiment in an apparatus that trapped all reaction products. | |  | b. | Lavoisier was able to make accurate mass measurements. | |  | c. | Lavoisier was able to make precise mass measurements. | |  | d. | Lavoisier did not trap gases in his experiments because their mass was negligible. | |  | e. | A and D |  |  |  | | --- | --- | | *ANSWER:* | d | | *POINTS:* | 1 | |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 61. The experiments of what two scientists were instrumental in determining the mass and charge of the electron?   |  |  |  | | --- | --- | --- | |  | a. | Lavoisier and Dalton | |  | b. | Rutherford and Curie | |  | c. | Thompson and Rutherford | |  | d. | Millikan and Cannizzaro | |  | e. | Thompson and Millikan |  |  |  | | --- | --- | | *ANSWER:* | e | | *POINTS:* | 1 | |

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| 62. ​Which of the following gases was discovered by Joseph Priestley?   |  |  |  | | --- | --- | --- | |  | a. | ​Neon gas | |  | b. | ​Oxygen gas | |  | c. | Methane gas | |  | d. | Ammonia gas | |  | e. | ​Helium gas |  |  |  | | --- | --- | | *ANSWER:* | b | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *TOPICS:* | 2.1 | | *KEYWORDS:* | general chemistry | |

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| 63. \_\_\_\_\_ proposes that, at the same temperature and pressure, equal volumes of different gases contain the same number of particles.   |  |  |  | | --- | --- | --- | |  | a. | Charles’ hypothesis | |  | b. | ​Dalton’s hypothesis | |  | c. | Boyle’s hypothesis | |  | d. | Avogadro’s hypothesis | |  | e. | Bergsman’s hypothesis |  |  |  | | --- | --- | | *ANSWER:* | d | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *TOPICS:* | 2.3 | | *KEYWORDS:* | general chemistry | |

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| 64. ​Identify the true statement(s).              1. An ion is an atom or group of atoms that has a net positive or negative charge.              2. An ion with positive charge is called cation.              3. An ion with negative charge is called anion.​   |  |  |  | | --- | --- | --- | |  | a. | ​1 only | |  | b. | 2 only | |  | c. | ​3 only | |  | d. | 2 and 3 | |  | e. | ​1, 2, and 3 |  |  |  | | --- | --- | | *ANSWER:* | e | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *TOPICS:* | 2.7 | | *KEYWORDS:* | general chemistry | |

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| 65. ​The relative molecular mass of a compound containing only carbon and hydrogen is 114. The compound contains 84% of carbon by mass. Predict the formula of the compound.   |  |  | | --- | --- | | *ANSWER:* | C8H18 | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *TOPICS:* | 2.4 | | *KEYWORDS:* | general chemistry | |

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| 66. ​The relative mass of a compound containing carbon, hydrogen, and oxygen is 180. The mass percentage of carbon and hydrogen in the compound is 40% and 6.7%, respectively. Determine the formula of the compound.   |  |  | | --- | --- | | *ANSWER:* | C6H12O6 | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *TOPICS:* | 2.4 | | *KEYWORDS:* | general chemistry | |