

Chemistry Scavenger Hunt

List of Items:

1. A substance containing the ester, methyl salicylate.
2. A silver halide emulsion.
3. A substance containing tartaric acid.
4. A sample of matter which contains only one kind of atoms. Identify the kind of atom with its symbol and atomic mass.
5. Material which, when burned, produces a gas that reacts with water vapor to produce acid rain. Verify with balanced equations for both the combustion of the substance and the production of acid rain.
6. Material which completes the following equation:
$$\text{Na}_2\text{CO}_3 + 2 \text{HCl} \rightarrow 2 \text{NaCl} + \underline{\hspace{2cm}} + \text{CO}_2$$
7. A sample of an element which could be the "X" in the formula X_2O_3 . Explain.
8. A sample of a solid whose density you have determined. Describe the procedure used and values obtained to make this determination.
9. A compound with at least 3 different elements. Give the common name and correct chemical formula.
10. A sample of matter which contains 1.5×10^{23} atoms to two significant digits. Show calculations to verify this.
11. A sample of matter which contains atoms with an oxidation state of +3. Give the correct formula.
12. A system at equilibrium. Describe the system and write the equilibrium expression.
13. A mass of water which would react exactly with sodium to produce 3.11 Liters of hydrogen gas at STP. Show calculations which verify this.
14. A sample of gas whose atoms have an average velocity less than that of oxygen atoms. Show calculations which verify this.
15. A sample of a gas labeled with its density at 25°C and 764 Torr. Show calculations which verify this.
16. An alkane.
17. A substance used as a commercial antifreeze, labeled with its chemical formula.
18. A commercial source of phenylethylamine.
19. A catalyst with its formula and a balanced equation where it is used.
20. A compound with its empirical formula which is different from its molecular formula.
21. Exactly 1.01 mL to three significant digits of a liquid other than water. Describe how you obtained this volume and show any calculations which you may have used.
22. A substance with ionic bonds. Give correct formula and ionization equation.
23. A sample of an element not used for any other item labeled with the number of protons and neutrons and its electron configuration.
24. A solid substance which does not dissolve in water, does not conduct electricity, and does not melt below 1500°C. Label with formula and bond type.
25. A sample of matter containing a radioactive element. Identify the radioactive element and give its decay equation.
26. A food additive and its purpose.
27. An enzyme.
28. A substance with weak van der Waals forces.
29. An organic compound with a six-membered ring. Give the structural formula and the condensed molecular formula.
30. A covalently bonded substance with an accurate description of the shape of the molecule including bond angles.
31. A compound which, when completely oxidized, would yield only CO_2 and H_2O . Give the balanced equation verifying this.
32. A sample of an element with more than 5 electrons in its outer shell.
33. A basic solution labeled with its $[\text{OH}^-]$
34. A saturated, dilute solution.
35. A solution with known molarity. Show calculations which verify this.

36. An acid with a K_a less than 1×10^5 . Label it with the K_a .
37. A basic anhydride. Give the equation of the item reacting with water.
38. A crystalline substance with a coordination number of 8.
39. A solid labeled with its volume in cm^3 and m^3 .
40. 0.10 mole of a compound other than water. Show calculations which verify this.
41. An element that is used as a lubricant.
42. Material which can be electrolyzed to produce a halogen. Give the detailed equation.
43. A mixture of gases labeled with the partial pressure of each component in Torr and kiloPascals.
44. A compound, not used for any other item, labeled with its percent composition. Show calculations which verify this.
45. A solution of NaClO labeled with its commercial name, % concentration, and molarity.
46. Two organic isomers.
47. A substance which would be nearly 100% ionized in a dilute solution. Give the ionization equation.
48. A sugar-water solution which would boil at 101.2°C and 1 atm. Describe how the solution was made and include any calculations used to verify its boiling point.
49. The mass of any salt needed to make 250. mL of a 0.200-M solution. Show calculations which verify this.
50. A drawing of an instrument used to measure small volumes of a liquid accurately.
51. Graph of the pH of a solution of a strong acid as a strong base is added until the solution becomes basic.
52. An acid/base indicator. Tell what color it is in acid and what color it is in base.
53. Sample of an element containing at least 2 isotopes. Identify and label with appropriate symbols showing the number of nucleons.
54. Illustration of a graduated cylinder (including graduation marks) which contains 25.3 mL of liquid to which a rock with a volume of 7.5 mL has been added.
55. The amount of water whose temperature will change by $+20^\circ\text{C}$ when it absorbs 3244 joules of heat energy.
56. A substance containing acetylsalicylic acid.
57. A substance used in a fire extinguisher
58. An alloy labeled as to constituents and percent composition.
59. An alkaloid.
60. A solid whose solution will have a $\text{pH} < 7$.
61. An electrochemical cell with half reactions.
62. A substance composed of nonpolar molecules.
63. An alcohol other than ethanol.
64. An example of a transition metal.
65. A commercial example of polystyrene.

Total number of items turned in: _____

Team members names:

Collection turned in on: _____
date