

Chemistry Semester 1 Midterm 1 Review Sheet 08-09**Completion**

Complete each sentence or statement.

1. A process that involves one or more substances changing into new substances is known as a _____ change.
2. Cutting a sheet of paper is an example of a _____ change.
3. A _____ property enables a substance to combine with or change into one or more substances.
4. Sugar is a _____ form of matter with a definite shape and volume.
5. The mass in grams of 2.75×10^{21} atoms Li is _____ g.
6. The molar mass of carbon tetrachloride (CCl_4) is _____ g/mol.
7. The number of moles present in 165 g manganese is _____ mol.

Short Answer

8. The distance between the earth and the sun is 90.0 million miles. Calculate this distance in meters up to three significant digits. (assume that 1609 m = 1 mile)
9. How many significant digits are there in 6.023×10^{23} molecules?

Compare and contrast each pair of related terms.

10. chemical property, physical property
11. If 2 g of element X combines with 7 g of element Y to form compound XY, how many grams of Y are needed to form compound XY_2 ? Explain your reasoning.

Use this information to answer the following questions.

A 24-g sample of carbon combines with 64 g of oxygen to form CO_2 .

12. What is the mass of the reactants?
13. What is the mass of the product?

Change the following data into scientific notation.

14. 5 000 000 km
15. 8 394 000 000 s
16. 0.000 421 g

Round the following to four significant figures.

17. 12.555 km
18. 1.0009
19. 99.999
20. 23.342 999

Complete the following calculations. Round off the answers to the correct number of significant figures.

21. 51.2 kg + 64.44 kg
22. 6.435 cm – 2.18 cm
23. 16 m × 2.82 m × 0.05 m
24. 3.46 m/1.82 s

Problem

25. A 13-g sample of calcium reacts with bromine to form 24 g of calcium bromide. How many grams of bromine are used in the reaction?
26. What is the percentage by mass of I if 4.07 g of it reacts with 10.63 g of II to form a compound of mass 14.70 g? Also, calculate the percentage by mass of II in the compound.
27. Determine the empirical formula for succinic acid that is composed of 40.60% carbon, 5.18% hydrogen, and 54.22% oxygen.
28. Ascorbic acid is used to improve the nutrient content of crops. It is composed of 36.20% carbon, 4.90% hydrogen, and 48.90% oxygen. The molar mass of ascorbic acid is 176.0 g/mol. Determine the empirical and molecular formulas for ascorbic acid.
29. Convert 100 km/h to m/s.

Essay

30. A sample of aluminum chloride (AlCl_3) has a mass of 100.0 g.
 - a. How many aluminum ions are present?
 - b. How many chloride ions are present?
 - c. What is the mass in grams of one formula unit of aluminum chloride?