Chemistry Problems

Fifth Edition

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Density and Specific Gravity

Name _____

Date _____

Solids and Liquids

1. Copper has a density of 8.9 g/cm^3. What is its specific gravity?

2. 8.0 cm^3 of platinum are found to have a mass of 171.2 g. Determine the density and specific gravity of platinum.

3. 50.0 cm^3 of lead have a mass of 565 g. What is the density of lead? The specific gravity?

4. Chloroform has a specific gravity of 1.5. What is its density? What is the mass of 1.0 dm^3 of chloroform?

5. 127 cm^3 of turpentine are found to have a mass of 114.3 g. What is the specific gravity of turpentine?

6. A block of granite with a volume of 3.8 m^3 has a mass of 638.30 kg. What is its specific gravity?

7. What is the mass of 137 cm^3 of nickel? The specific gravity of nickel is 8.8.

8. Calculate the specific gravity of marble from the fact that 321 cm^3 of the material have a mass of 866.7 g.

9. Steel has a specific gravity of 7.8. What volume of steel would have a mass of 1.00 kg?

10. What is the mass of 1.2 dm^3 of pine wood? The specific gravity of pine wood is 0.4.

11. 78 cm^3 of soft coal have a mass of 101.4 g. What is its specific gravity?

12. Brass has a specific gravity of 8.5. What would be the mass of 1.0 m^3 of brass in kg?

13. The concentrated sulfuric acid in a 500.0 cm^3 flask has a mass of 920 g. What is the specific gravity of sulfuric acid?

(continued)

14. 421 cm^3 of water at 4 °C are cooled to 0 °C. The new volume is 425 cm^3. What is the density of water at 0 °C?

15. Cast iron has a specific gravity of 7.1. What is the density of cast iron in kilograms per cubic meter?

16. What is the mass of 62.3 cm^3 of carbon tetrachloride if the specific gravity of carbon tetrachloride is 1.6?

17. Carbon disulfide may be purchased in bottles containing 100.0 kg of the disulfide. These bottles have a volume of 1.27 m^3. What is the specific gravity of carbon disulfide? What is the weight of 1.00 dm^3 of carbon disulfide?

18. 50.0 mL of water at 4 °C are frozen to ice. The volume of the ice produced is 54.5 cm^3. What is the density and specific gravity of the ice?

19. Seawater has a specific gravity of 1.03. A certain sample of seawater was found to have a mass of 154 g. What was the volume of the water?

20. What is the mass of 5.0 dm^3 of mercury? The specific gravity of mercury is 13.6.

Gases and Vapors

Note: In the following problems, **air** is the standard used in determining specific gravity.

1. 500.0 cm^3 of hydrogen chloride have a mass of 0.819 6 g. Find the density and specific gravity of this gas.

2. 1.0 dm^3 of ammonia has a mass of 0.771 0 g. Find the density and specific gravity of ammonia.

3. The density of nitrous oxide is 1.977 8 g/dm^3. Calculate the molecular mass and specific gravity of this gas.

4. The specific gravity of carbon monoxide is 0.967. What is its density and molecular mass?

(continued)

5. The specific gravity of chlorine is 2.49. What is its density and molecular mass?

6. The density of hydrogen is 0.089 8 g/dm^3. What is its specific gravity and molecular mass?

7. 250 cm^3 of krypton gas have a mass of 0.934 g. Find the density, specific gravity, and molecular mass of kyrpton.

8. Find the mass of 5.0 dm^3 of carbon dioxide.

9. The specific gravity of stibine is 4.34. Find the density and molecular mass of this gas.

10. 100.0 cm^3 of silicon tetrafluoride have a mass of 0.461 g. Find the density, specific gravity, and molecular mass of the gas.

11. Find the density of chlorine.

12. The density of phosphorus trifluoride is 3.90 g/dm^3. Find its specific gravity and molecular mass.

13. Find the mass of 200.0 cm^3 of sulfur monochloride, S_2Cl_2.

14. Determine the specific gravity of methane, CH_4.

15. 400.0 cm^3 of hydrogen iodide have a mass of 2.28 g. Find the density, specific gravity, and molecular mass.

16. What is the specific gravity of bromine vapor?

17. Find the mass of 100.0 cm^3 of xenon.

18. The specific gravity of carbonyl sulfide, COS, is 2.10. Find its density and molecular mass.

(continued)

19. The density of an unknown gas is 2.09 g/dm^3. Find its specific gravity and molecular mass.

20. 300.0 cm^3 of sulfur dioxide have a mass of 0.878 1 g. Find the density, specific gravity, and molecular mass of this gas.

21. The density of helium if 0.178 5 g/dm^3. Find the specific gravity and molecular mass of helium.

22. Find the mass of 450.0 cm^3 of hydrogen sulfide.

23. The specific gravity of nitric oxide is 1.037. Find its density and molecular mass.

24. What is the specific gravity of argon?

25. 50.0 cm^3 of oxygen weigh 0.071 4 g. Find the density, specific gravity, and molecular mass of oxygen.

26. What is the mass of 285 cm^3 of tellurium hydride, TeH_2?

27. Find the density and specific gravity of nitrogen.

28. The specific gravity of hydrogen fluoride is 0.988. What molecular mass does this give for the compound?

29. What is the mass of 5.2 dm^3 of phosgene, $COCl_2$?

30. Calculate the density and specific gravity of hydrogen bromide.