

EXTRA PROBLEMS – UNIT 1

Chem 110

1. The mass of the earth is estimated to be 6.6×10^{21} tons. Express the mass of the Earth in the following units (a) g (b) kg (c) ng (d) oz
2. The luggage compartment of an automobile has the dimensions 95 cm x 105 cm x 145 cm. What is the volume of this compartment in cubic feet?
3. Calculate the volume, in milliliters, of 50.0 g of each of the following.
(a) acetone (d = 0.791 g/mL) (b) sodium (d = 10.40 g/mL) (c) carbon monoxide (d = 1.25 g/L)
(d) rock salt (d = 2.18 g/cm³)
4. An automobile gasoline tank holds 13.0 gal when full. How many pounds of gasoline will it hold, if the gasoline has a density of 0.56 g/mL?
5. The concentration of sugar in a sugar solution is found to be 2.30 µg/L. What is the sugar concentration in the following units? (a) mg/L (b) µg/mL (c) cg/cL (d) kg/m³
6. How many grams of water are contained in 65.3 g of a mixture of alcohol and water that is 34.2% water by mass?
7. A solution (a type of mixture) of table salt in water contains 15.3% by mass table salt. In a 542 g sample of this solution, how many grams of table salt are present?
8. If your blood has a density of 1.05 g/mL at 20°C, how many grams of blood would you lose if you donated 1.00 pint of blood?
9. A square piece of aluminum foil, 4.0 in. on a side, is found to weigh 0.466 g. What is the thickness of the foil, in millimeters, if the density of the foil is 269 cg/cm³?
10. A certain chemical process consumes water at a rate of 55 L/sec. Express this water consumption rate in the following units. (a) L/hr (b) kL/sec (c) dL/min (d) mL/day