

Tutorial 1

1. Give an example for each of the following terms:
a. Matter b. Substance c. Mixture
2. Give an example of homogeneous mixture and an example of heterogeneous mixture.
3. Explain the difference between a physical property and chemical property.
4. As the following statements describe chemical and physical property.
a. Water boil below 100 °C on top of a mountain.
b. Lead is denser than aluminum.
c. Sugar tastes sweets.
5. Give the SI units for expressing the following:
a. Length b. volume c. mass d. time e. energy f. temperature
6. Write the numbers presented by the following prefixes:
a. mega- b. kilo- c. deci- d. centi- e. milli- f. micro- g. nano- h. pico-
7. An oversea flight leaves New York in the late afternoon and arrives in London 8.50 hours later. The airline distance from New York to London is about 5.6×10^3 km. What is the average speed of the plane in kilometers per hours? (658.8 km/h)
8. Express normal body temperature, 98.60 °F in °C and Kelvin. (37.0 °C, 310.15 K)
9. Carry out the following conversions.
a. 76.3 mm to meters (0.0763 m)
b. 482.2 in³ to cubic centimeters? (7902 cm³)
c. 476 cm² to square inches (73.8 in²)
10. An average adult has 5.2 L of blood, what volume of blood in m³? (5.2 x 10⁻³ m³)
11. A person's average daily intake of glucose (a form of sugar) is 0.0833 pound (lb), what is this mass in milligrams (mg)? (3.78 x 10⁴ mg)
12. To determine the density of ethyl alcohol, a student pipets a 5.00 mL sample into an empty flask weight 15.246 g, he finds that the mass of the flask + ethyl alcohol =19.171g. Calculate the density of ethyl alcohol. (0.785 g/mL)
13. The density of ethanol, a colorless liquid is 0.798 g/mL. Calculate the mass of 17.4 mL of the liquid? (13.9 g)
14. Carry out the following conversions
a. 90.0 km/h to meters per second. (25.0 m/s)
b. 4.17 g/s to kilograms per hour. (15.0 kg/h)
c. 1.39 ft/s to kilometer per hour. (1.53 km/h)
15. The commonly accepted measurement now used by dietary specialist in assessing whether a person is overweight is the body mass index (BMI). BMI is based on a person's weight and height. It is the mass, in kilograms, divided by the square of the height in meters, which is, expressed in kg/m². Generally speaking, if the BMI exceeds 25, a person considered overweight. What is the BMI of a person is 69.0 inches tall and weight 158 lb? (23.3 kg/m²)