

WKS #1-2: Review Chapter 1

Name _____

Problems from pp. 33-36 #1.26, 1.48, 1.52, 1.69, 1.88, 1.92

For calculations, show all work and express your answers to the correct number of sig figs.

1.26 Convert the following temperatures to °C:

- (a) 77 K _____
- (b) 4.2 K _____
- (c) 601 K _____

1.48 Perform the following conversions:

- (a) 185 nm to m
- (b) 4.5×10^9 yr to s
- (c) 71.2 cm^3 to m^3
- (d) 88.6 m^3 to L

1.52 Which of the following statements describe physical properties and which describe chemical properties? Explain

- (a) Iron has a tendency to rust.
- (b) Rainwater in industrialized regions tends to be acidic.
- (c) Hemoglobin molecules have a red color.
- (d) When a glass of water is left out in the sun, the water gradually disappears.
- (d) Carbon dioxide in air is converted to more complex molecules by plants during photosynthesis.

- 1.69 The total volume of seawater on earth is 1.5×10^{21} L. Assume that seawater contains 3.1% sodium chloride by mass and that its density is 1.03 g/mL. Calculate the total mass of sodium chloride in kilograms.
- 1.88 Sodium hypochlorite (NaOCl) is used to disinfect swimming pools. The ideal concentration for this purpose is 1 ppm chlorine (1 g NaOCl per 1×10^6 grams of H_2O). Calculate the volume of NaOCl solution (in mL) a homeowner should add to her swimming pool if the solution contains 6.0 % NaOCl by mass and there are 2.0×10^4 gallons of water in the pool.
 1 gallon = 3.79 L density of liquids = 1.0 g/mL
- 1.92 A gas company charges \$1.30 for 15.0 ft^3 of natural gas.
 (a) Convert this rate to dollars per liter of gas.
 b) If it takes 8.61 L of CH_4 to boil a liter of water, starting at room temperature (25°C), how much would it cost to boil a 2.1 L kettle of water?
- 1.93 Pheromones are compounds secreted by females of many insect species to attract mates. Typically, 1.0×10^{-8} g of a pheromone is sufficient to reach all targeted males within a radius of 0.50 mi. Calculate the density of the pheromone (in g/L) in a circular air space having a radius of 0.50 mi and a height of 40 ft. [Hint: first calculate the volume of the cylinder described in cm^3 .]

Answers: 1.26a) -196°C ; 1.26b) -269°C ; 1.26c) 328°C ; 1.48a) 1.85×10^{-7} m; 1.48b) 1.4×10^{17} s; 1.48c) 7.12×10^{-5} m³; 1.48d) 8.86×10^4 L; 1.69) 4.8×10^{19} kg; 1.88) 1.3×10^5 mL (1.3 L); 1.92a) $\$3.06 \times 10^{-3}$ /L; 1.92b) $\$0.055$ (5.5¢); 1.93) 4.0×10^{-19} g/L