

**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)  $4.5 \times 10^9$  yr to s(c) 71.2 cm<sup>3</sup> to m<sup>3</sup>(d) 88.6 m<sup>3</sup> 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  $1.5 \times 10^{21}$  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  $1 \times 10^6$  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  $2.0 \times 10^4$  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  $15.0 \text{ ft}^3$  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 ( $25^\circ\text{C}$ ), 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,  $1.0 \times 10^{-8}$  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  $\text{cm}^3$ .]

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