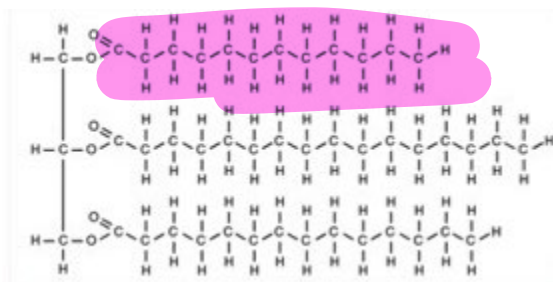


Problem Set 1:

Solutions

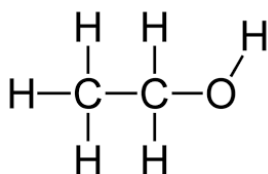
1. Predict whether each of the following substances would be more soluble in water or heptane (C_7H_{16}): Identify the main IMF between solvent molecules and solute molecules for each example

a. Triglyceride



mostly nonpolar long hydrocarbon chain solvent C_7H_{16} is main IMF dispersion

b. ~~ethanol~~ (shown below)



solvent is H_2O b/c ethanol can form H-bonds w/ water molecules

c. potassium bromide



solvent is H_2O main IMF is ion-dipole.

2. A 13.0% solution of K_2CO_3 by mass has a density of 1.09 g/cm^3 . Calculate the molality of the solution.

(m/m)

extra info!

mass of solvent:

13.0 g K_2CO_3

100. g of solution

$100. \text{ g} - 13.0 \text{ g} =$

$$13.0 \text{ g } K_2CO_3 \times \frac{1 \text{ mol}}{138.2 \text{ g}} =$$

87.0 g

0.0941 mol

0.087 kg

$$m = \frac{\text{mol solute}}{\text{kg solvent}}$$

$$m = \frac{0.0941 \text{ mol } \text{K}_2\text{CO}_3}{0.0870 \text{ kg}}$$

1.08 m