Complete the following questions to practice these concepts.

    a. If 500 mL of ferric chloride solution weigh 650 g, what is the specific gravity?

Specific gravity $= \dfrac{weight\ of\ substance}{weight\ of\ equal\ volume\ of\ water}$

Specific gravity $= \dfrac{650\ g}{500\ g} = \mathbf{1.3}$

    b. The specific gravity of alcohol is 0.815. What is its specific volume?

Specific gravity $= \dfrac{1}{Specific\ Volume}$

$\mathbf{0.815} = \dfrac{1}{Specific\ Volume} = \mathbf{1.227}$

    c. What is the weight in grams of 5 mL of concentrated nitric acid with specific gravity 1.41?

Specific gravity $= \dfrac{weight\ of\ substance}{weight\ of\ equal\ volume\ of\ water}$

$\mathbf{1.41} = \dfrac{X\ g}{5\ mL} = \mathbf{7.05}$

    d. Calculate the volume in millilitres, of 100 g of Castor oil (SG. = 0.96)

Specific volume $= \dfrac{1}{Specific\ Gravity} = \dfrac{1}{0.96} = \mathbf{1.042}$

Specific Volume $= \dfrac{volme\ of\ known\ weight\ of\ substance\ (ml)}{volume\ of\ equal\ weight\ of\ water\ (ml)}$

$\mathbf{1.042} = \dfrac{X\ (ml)}{100\ (ml)} = \mathbf{104.2\ mL}$

    e. What is the weight in kilograms, of 1 gallon of sorbitol solution having a specific gravity of 1.285?

1 UK Gallon = 4.546 L = 4546 mL = 4546 g equivalent weight of water

Specific gravity $= \dfrac{weight\ of\ substance}{weight\ of\ equal\ volume\ of\ water}$ **therefore** $\mathbf{1.285} = \dfrac{X\ g}{4546\ g} = \mathbf{5841.6\ g}$

= 5.842 kg

f. If fifty glycerine suppositories are made from the following formula, how many millilitres of glycerine (having a specific gravity of 1.23), would be used in the preparation of 96 suppositories?

Glycerine Suppository Formula

Glycerine	91 g
Sodium stearate	9 g
Purified water	5 g

If $\dfrac{91\ grams\ of\ glycerin}{50\ suppos} = \dfrac{x\ g\ glycerin}{96\ suppos}$ $therefore\ x = 174.72\ g$ of glycerin

$$\textbf{Specific volume} = \frac{1}{Specific\ Gravity} = \frac{1}{1.23} = \mathbf{0.813}$$

$$\textbf{Specific Volume} = \frac{volme\ of\ known\ weight\ of\ substance\ (\boldsymbol{ml})}{volume\ of\ equal\ weight\ of\ water\ (\boldsymbol{ml})}$$

$$\mathbf{0.813} = \frac{X\ (\boldsymbol{ml})}{174.72\ (\boldsymbol{ml})} = \mathbf{142\ mL}$$

g. A formula containing 35 mL of Arachis oil is used to make 60 mL of emulsion. Arachis oil is available in jars of 1.2 kg of Arachis oil. If the specific gravity of Arachis oil is 0.92, how many milliliters of Arachis oil will be used to make 50 mL of Emulsion?

If $\dfrac{35\ mL\ of\ Arachis}{60\ of\ Emulsion} = \dfrac{x\ mL\ Arachis}{50\ mL\ Emuslion} = 29.17\ mL$

$$\textbf{Specific gravity} = \frac{weight\ of\ substance}{weight\ of\ equal\ volume\ of\ water} \qquad \textbf{therefore } \mathbf{0.92} = \frac{X\ g}{29.17\ g} = \mathbf{26.84\ g}$$

26.84 g = 0.02684 kg