

KSCP (2000/01) : STOICHIOMETRY

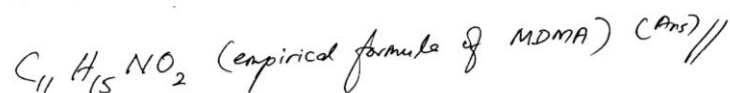
$$Q_1(a) \quad n_C : n_H : n_N : n_O$$

$$\frac{68.4}{12} : \frac{7.8}{1} : \frac{7.2}{14} : \frac{16.6}{16}$$

$$5.7 : 7.8 : 0.514 : 1.0$$

$$\frac{5.7}{0.5} : \frac{7.8}{0.5} : 1 : \frac{1.04}{0.5}$$

$$11.4 : 15.6 : 2 : 2$$



$$Q_1(b) \quad n_C : n_H$$

$$\frac{89.49}{12} : \frac{10.51}{1}$$

$$7.458 : 10.51$$

$$(1 : 1.4) \times 2$$

$$2 : 3$$

Empirical formula C_2H_3

$$(C_2H_3)_n = 536.89$$

$$27n = 536.89$$

$$n = 20$$

Molecular formula: $C_{40}H_{60}$

∴ Molecular Mass (Relative) = 540 (Ans) //

Q₁(c)

$$(i) \quad M_r(K_2CrO_4) = 2(39.098) + (51.996) + 4(15.999) \text{ g mol}^{-1}$$

$$= 194.188 \text{ g mol}^{-1}$$

$$\text{mass of } K_2CrO_4 = 194.188 \text{ g (=1 mol) Ans //}$$

(c)(ii) The concentration of the solution (194.188 g in 1.00 L water) prepared is slightly less than desired. This is because the final volume of the solution would be slightly larger than 1.00 L. To obtain an accurate molarity, we add enough water to give a total volume of 1.00 L. The actual volume of water is not important, only that the total final volume is 1.00 L.

(c)(iv) Weigh accurately 194.1880 g. Add about 250 mL of distilled water and transfer the solid using a funnel. Wash down any solid clinging to the neck with a small amount of water. Dissolve the solid thoroughly by swirling. If necessary, wait for the solution to reach room temperature. Add distilled water to bring the volume exactly to the line on the flask neck, then cover and mix thoroughly again.

Prepared by
V. Manoharan
vmano@usm.my
manovv1955@yahoo.com
 04-6533888 ext 3566