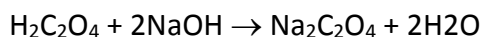


Answer on Question #67877 – Chemistry – General Chemistry

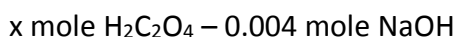
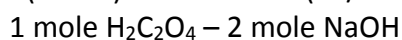
10.08 g of ethane dioic acid (oxalic acid) crystals $\text{H}_2\text{C}_2\text{O}_4 \cdot x\text{H}_2\text{O}$ made up of 1 dm³ of solution. 25 cm³ of this solution completely neutralized by 20 cm³ of 0.2 M sodium hydroxide solution. Calculate the

- molarity of acid
- number of moles of water of crystallization in 1 mole of the acid

Solution:



$$n(\text{NaOH}) = M \times V = 0.2 \times (20/1000) = 0.004 \text{ mole}$$



$$x = 0.002 \text{ mole } \text{H}_2\text{C}_2\text{O}_4$$

$$\text{a) } C_M(\text{H}_2\text{C}_2\text{O}_4) = n(\text{H}_2\text{C}_2\text{O}_4)/V(\text{solution}) = 0.002/0.025 = 0.08 \text{ M}$$

$$\text{b) } M(\text{H}_2\text{C}_2\text{O}_4) = 90 \text{ g/mole}$$

$$n(\text{H}_2\text{C}_2\text{O}_4) = m(\text{H}_2\text{C}_2\text{O}_4)/M(\text{H}_2\text{C}_2\text{O}_4) = (10.08 - y)/90 = 0.08 \text{ mole}$$

$$y = 2.88 \text{ g } \text{H}_2\text{O}$$

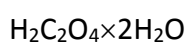
$$(90 + x \times 18) \text{ g } \text{H}_2\text{C}_2\text{O}_4 \cdot x\text{H}_2\text{O} - (x \times 18) \text{ g } \text{H}_2\text{O}$$

$$10.08 \text{ g } \text{H}_2\text{C}_2\text{O}_4 \cdot x\text{H}_2\text{O} - 2.88 \text{ g } \text{H}_2\text{O}$$

$$181.44x = 259.2 + 51.84x$$

$$129.6x = 259.2$$

$$x = 2$$



$$\text{Answer: a) } C_M(\text{H}_2\text{C}_2\text{O}_4) = 0.08 \text{ M}$$

