

Answer on Question #55578 – Chemistry – Inorganic Chemistry

Questions:

An undergraduate student weighed 20g of sodium carbonate salt, if Na=23, O =16, carbon =12 and H=1, what is the mole of the hydroxide?

Solution:

$$m(\text{NaHCO}_3) = 20 \text{ g};$$

$$\text{Ar}(\text{Na}) = 23 \text{ g}\times\text{mol}^{-1};$$

$$\text{Ar}(\text{O}) = 16 \text{ g}\times\text{mol}^{-1};$$

$$\text{Ar}(\text{C}) = 12 \text{ g}\times\text{mol}^{-1};$$

$$\text{Ar}(\text{H}) = 1 \text{ g}\times\text{mol}^{-1};$$

$$n(\text{OH}^-) - ?$$

$$M(\text{NaHCO}_3) = \text{Ar}(\text{Na}) + \text{Ar}(\text{H}) + \text{Ar}(\text{C}) + 3\text{Ar}(\text{O});$$

$$M(\text{NaHCO}_3) = 84 \text{ g}\times\text{mol}^{-1};$$

$$n = \frac{m}{M};$$

$$n(\text{NaHCO}_3) = \frac{m(\text{NaHCO}_3)}{M(\text{NaHCO}_3)};$$

$$n(\text{NaHCO}_3) = 0.238 \text{ mol};$$

One molecule of NaHCO₃ contains one OH⁻ group. According to this statement:

$$n(\text{OH}^-) = n(\text{NaHCO}_3) = 0.238 \text{ mol};$$

Answer: 0.238 mol