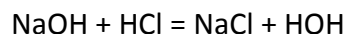


Question #75403, Chemistry / Physical Chemistry / Completed

5 gm impure calcium hydroxide is dissolved into 800 ml of water. From this solution 20 ml of decinormal HCl is added. The acidic solution formed is neutralized by 50 ml of N/50 ml of NaOH solution. Percentage purity of Ca(OH)_2 is
(1) 44% (2) 5.92%. (3) 14.34%. (4) 7.5%

Solution:

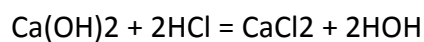


$$n(\text{NaOH}) = 0.050 \text{ L} \times \text{N}/50 \text{ mole/L} = 0.001 \text{ mole}$$

$$n(\text{HCl}) = n(\text{NaOH}) = 0.001 \text{ mole} - \text{reacts with NaOH}$$

$$0.02 \text{ L} \times 0.1 \text{ M} = 0.002 \text{ mol HCl} - \text{was in the solution}$$

$$\Delta = 0.002 - 0.001 = 0.001 \text{ mol} - \text{reacts with } \text{Ca(OH)}_2$$



$$n(\text{Ca(OH)}_2) = \frac{1}{2} 0.001 \text{ mol} = 0.0005 \text{ mol}$$

$$m = 0.0005 \text{ mol} \times 40 \text{ g/mol} = 0.02 \text{ g}$$

$$0.02 / 5 \text{ g} \times 100 \% = 0.4 \%$$

Answer: 0.4 %.