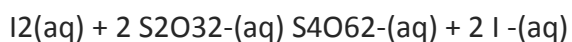
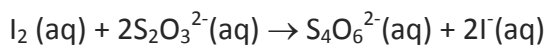


Answer on Question #81375, Chemistry/ General Chemistry

How many milliliters of 0.350 M Na₂S₂O₃ solution are needed to titrate 2.423 g of I₂ to the equivalence point?



Solution



Find amount of substance of I₂:

$$n = m/M$$

$$M(\text{I}_2) = 127 \times 2 = 254 \text{ (g/mol)}$$

$$n(\text{I}_2) = 2.423 \text{ g} / 254 \text{ g/mol} = 0.009539 \text{ mol}$$

According to equation mole ratio $n(\text{I}_2):n(\text{S}_2\text{O}_3^{2-})=1:2$, i.e. $n(\text{S}_2\text{O}_3^{2-})=2 \times n(\text{I}_2) = 2 \times 0.009539 \text{ mol} = 0.01908 \text{ mol}$

To find volume of Na₂S₂O₃ we should use formula for concentration:

$$c = n/V \Rightarrow V = n/c$$

$$V = 0.01908 / 0.350 = 0.05451 \text{ L} = 54.51 \text{ mL}$$

Answer: 54.51 mL