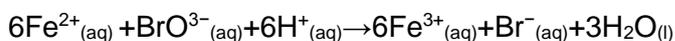


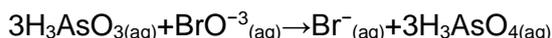
## Answer on Question #55506 – Chemistry - General chemistry

### Question:

1) What is the molar concentration of  $\text{Fe}^{2+}$  ion in an aqueous solution if 35.50 mL of 0.103 M  $\text{KBrO}_3$  is required for complete reaction with 11.00 mL of the  $\text{Fe}^{2+}$  solution? The net ionic equation is:



2) What is the molar concentration of As(III) in a solution if 24.95 mL of 0.115 M  $\text{KBrO}_3$  is needed to titrate 54.45 mL of the As(III) solution? The balanced equation is



3) What is the mass percent Fe in a 0.1855 g sample if 12.32 mL of a 0.1015 M  $\text{Sn}^{2+}$  solution is needed to titrate the  $\text{Fe}^{3+}$ ? Express your answer using four significant figures.

### Answer:

$$1) \quad C_M = \frac{v}{V} \quad v = C_M \cdot V \quad v(\text{BrO}^{3-}) = 6 \cdot v(\text{Fe}^{2+})$$

$$6 \cdot (C_M(\text{Fe}^{2+}) \cdot V(\text{Fe}^{2+})) = C_M(\text{BrO}^{3-}) \cdot V(\text{BrO}^{3-})$$

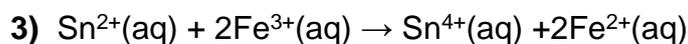
$$6 \cdot (C_M(\text{Fe}^{2+}) \cdot 11.00) = 0.103 \cdot 35.50$$

$$C_M(\text{Fe}^{2+}) = \frac{0.103 \cdot 35.50}{6 \cdot 11.00} = 0.061$$

$$2) \quad 3 \cdot (C_M(\text{H}_3\text{AsO}_3) \cdot V(\text{H}_3\text{AsO}_3)) = C_M(\text{BrO}^{3-}) \cdot V(\text{BrO}^{3-})$$

$$3 \cdot (C_M(\text{H}_3\text{AsO}_3) \cdot 54.45) = 0.115 \cdot 24.95$$

$$C_M(\text{H}_3\text{AsO}_3) = \frac{0.115 \cdot 24.95}{3 \cdot 54.45} = 0.021$$



$$C_M = \frac{v}{V} \quad v = C_M \cdot V \quad v = \frac{m}{M}$$

$$v(\text{Fe}^{3+}) = 2 \cdot v(\text{Sn}^{2+})$$

$$v(\text{Fe}^{3+}) = 2 \cdot 0.1015 \cdot \frac{12.32}{1000} = 0.0025 \text{ mol}$$

$$M(\text{Fe}) = 55.847 \text{ g / mol}$$

$$m(\text{Fe}) = v \cdot C_M$$

$$m(\text{Fe}) = 0.0025 \cdot 55.847 = 0.140 \text{ g}$$

$$\%(\text{Fe}) = \frac{0.140}{0.1855} \cdot 100 = 75.4717\%$$