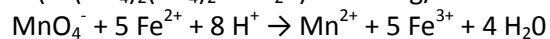


Questions from the “PAL Prüfungsbuch”
Stoichiometry – Part 2

451: In the course of the titration of $m_E = 0.2500$ g iron ore with potassium permanganate solution $\tilde{c}(\frac{1}{5} \text{KMnO}_4) = 100$ mmol/L accidentally too much standard solution was applied. Therefore $m_M = 500.0$ g Mohr salt, $\text{Fe}(\text{NH}_4)_2(\text{SO}_4)_2 \cdot 6 \text{H}_2\text{O}$, was added to the solution. The titration was continued. A total of $V = 33.30$ mL potassium permanganate solution was consumed. How much iron was contained in the ore?

$$M(\text{Fe}) = 55.80 \text{ g/mol}$$

$$M(\text{Fe}(\text{NH}_4)_2(\text{SO}_4)_2 \cdot 6 \text{H}_2\text{O}) = 392.0 \text{ g/mol}$$



- 1) 22.9 %
- 2) 24.8 %
- 3) 38.3 %
- 4) 45.8 %
- 5) 74.3 %

456: For the determination of the acid value $m = 1.251$ g of an oil are dissolved in neutralized alcohol and then titrated with $V = 22.3$ mL KOH, $\tilde{c}(\text{KOH}) 0.1$ mol/L, $t = 1.0000$, against phenolphthalein. What is the acid value AV (in mg/g)?

$$M(\text{KOH}) = 56.1 \text{ g/mol}$$

- 1) AV = 50.0 mg/g
- 2) AV = 124 mg/g
- 3) AV = 125 mg/g
- 4) AV = 100 mg/g
- 5) AV = 155 mg/g

469: 50.0 mL of an Fe^{2+} -containing solution consumes $V = 24.6$ mL potassium permanganate when titrated.

$$\tilde{c}(1/5\text{KMnO}_4) = 0.1 \text{ mol/L}, t = 0.986$$

What is the mass concentration $\beta(\text{Fe}^{2+})$ in g/L of the employed solution?

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

- 1) $\beta(\text{Fe}^{2+}) = 1.35 \text{ g/L}$
- 2) $\beta(\text{Fe}^{2+}) = 2.71 \text{ g/L}$
- 3) $\beta(\text{Fe}^{2+}) = 4.06 \text{ g/L}$
- 4) $\beta(\text{Fe}^{2+}) = 5.41 \text{ g/L}$
- 5) $\beta(\text{Fe}^{2+}) = 6.77 \text{ g/L}$

481: The pH-measurement of a water sample results in a pH-value of 7.5. What is the mass concentration $\beta(\text{H}_3\text{O}^+)$ in $\mu\text{g/L}$?

$$M(\text{H}_3\text{O}^+) = 19 \text{ g/mol.}$$

- 1) $\beta(\text{H}_3\text{O}^+) = 0.32 \mu\text{g/L}$
- 2) $\beta(\text{H}_3\text{O}^+) = 0.60 \mu\text{g/L}$
- 3) $\beta(\text{H}_3\text{O}^+) = 7.5 \mu\text{g/L}$
- 4) $\beta(\text{H}_3\text{O}^+) = 0.75 \mu\text{g/L}$
- 5) $\beta(\text{H}_3\text{O}^+) = 0.032 \mu\text{g/L}$