RT · Extra practice

Original diploma-style practice | Items 1-2

Extra practice for this lesson. Original questions, not released diploma items. Select one option for multiple choice; other tasks state the required response.

Use the givens and conditions in each prompt. Enter the requested count, coefficient, oxidation number or potential with the stated unit and precision.

RT-D01 · Numerical response

Initial buret reading 1.35 mL; final reading 20.85 mL. What is the titre in mL? Enter to two decimal places.

Response: _____

RT-D02 · Multiple choice

In a redox titration, which solution is placed in the buret?

A. The solution of unknown concentration
B. The solution of known concentration
C. Distilled water
D. The indicator only

Response: _____

RT · Extra practice

Original diploma-style practice | Items 3-4

RT-D03 · Numerical response

Trials of 18.40 mL and 18.50 mL agree within the limit of 0.20 mL. What is their average in mL? Enter to two decimal places.

Response: _____

RT-D04 · Numerical response

Given $MnO_4^- + 8H^+ + 5Fe^{2+} \rightarrow Mn^{2+} + 4H_2O + 5Fe^{3+}$. A reaction uses 0.30 mmol of MnO_4^-. How many millimoles of Fe^{2+} react? Enter to one decimal place.

Response: _____

RT · Extra practice

Original diploma-style practice | Items 5-6

RT-D05 · Select all that apply

Select every correct statement about a permanganate titration of iron(II).

A. MnO_4^- is purple and Mn^{2+} in dilute solution is almost colourless
B. A faint pink that stays marks the endpoint
C. A deep purple flask means the titre is too small
D. No extra indicator is needed

Response: _____

RT-D06 · Numerical response

Given $MnO_4^- + 8H^+ + 5Fe^{2+} \rightarrow Mn^{2+} + 4H_2O + 5Fe^{3+}$. A 20.00 mL sample of $Fe^{2+}(aq)$ needs 16.00 mL of 0.0100 mol/L $MnO_4^-(aq)$. Find $c(Fe^{2+})$ in mol/L to four decimal places.

Response: _____

RT · Extra practice

Original diploma-style practice | Items 7-8

RT-D07 · Numerical response

Given $5H_2C_2O_4 + 2MnO_4^- + 6H^+ \rightarrow 10CO_2 + 2Mn^{2+} + 8H_2O$. A 25.00 mL sample of $H_2C_2O_4(aq)$ needs 20.00 mL of 0.0100 mol/L $MnO_4^-(aq)$. Find $c(H_2C_2O_4)$ in mol/L to four decimal places.

Response: _____

RT-D08 · Numerical response

A 25.00 mL aliquot from a 250.0 mL solution contains 4.00×10^{-4} mol of Fe^{2+}. What mass of iron, in grams, is in the whole 250.0 mL solution (Fe: 55.85 g/mol)? Enter to three decimal places.

Response: _____

RT · Extra practice

Original diploma-style practice | Items 9-10

RT-D09 · Multiple choice

A student records the final buret reading smaller than the true reading. What is the effect on the calculated analyte concentration?

A. Too high
B. Too low
C. Unchanged
D. Cannot be determined

Response: _____

RT-D10 · Ordering / ranking

Arrange the steps of the titration calculation from first to last.

First to last

1. Find the moles of analyte using the mole ratio
2. Calculate the moles of titrant from c × V
3. Convert the titre to litres
4. Divide the moles of analyte by the analyte volume

Response: _____

RT · Extra practice

Original diploma-style practice | Items 11-12

RT-D11 · Matching

Match each error to its effect on the calculated c(Fe^{2+}) in a permanganate titration.

Items to match:

1. Too much titrant added
2. Flask rinsed with water and left wet
3. Buret rinsed with water, not titrant

Targets:

A. Too high
B. Unchanged
C. Too high (titrant made weaker)

Response: _____

RT-D12 · Written response

Explain the difference between the equivalence point and the endpoint in a permanganate titration.

Response: _____