

Competition Corner: Electron Accounting

g10_u06_w21

Use only supplied equation models. State the medium, conserve both atoms and charge, and separate a balanced-equation result from a mechanism, rate, or voltage claim.

1. For $\text{Cr}_2\text{O}_7^{2-} \rightarrow \text{Cr}^{3+}$ in acidic solution, find Cr's oxidation-number change and determine the total electrons needed in the reduction half-reaction.
2. Balance the acidic half-reaction $\text{NO}_2^- \rightarrow \text{NO}_3^-$, including H_2O , H^+ , and electrons. Check charge.
3. A student labels Fe^{2+} the oxidizing agent because its charge is positive. Critique the reasoning using the supplied manganese/iron model.
4. In a combined redox equation, 6 electrons appear on both sides after scaling. Explain why they are canceled and why the remaining equation still conserves electron transfer.
5. State one additional kind of evidence needed before claiming that a balanced redox equation produces a measurable voltage in a particular device.