



Oxidation and Reduction

Set 26: Balancing Overall Redox Equations

Write balanced equations for the following redox reactions:

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|--|---|
| 1. $\text{Br}_2 + \text{I}^- \rightarrow \text{Br}^- + \text{I}_2$ | 2. $\text{Cu} + \text{Ag}^+ \rightarrow \text{Cu}^{2+} + \text{Ag}$ |
| 3. $\text{Mg} + \text{Pb}^{2+} \rightarrow \text{Mg}^{2+} + \text{Pb}$ | 4. $\text{Mg} + \text{H}^+ \rightarrow \text{Mg}^{2+} + \text{H}_2$ |
| 5. $\text{Al} + \text{H}^+ \rightarrow \text{Al}^{3+} + \text{H}_2$ | 6. $\text{Mg} + \text{Cu}^{2+} \rightarrow \text{Mg}^{2+} + \text{Cu}$ |
| 7. $\text{Al} + \text{Zn}^{2+} \rightarrow \text{Al}^{3+} + \text{Zn}$ | 8. $\text{Cu} + \text{Fe}^{3+} \rightarrow \text{Cu}^{2+} + \text{Fe}^{2+}$ |
| 9. $\text{Zn} + \text{Ag}^+ \rightarrow \text{Zn}^{2+} + \text{Ag}$ | 10. $\text{Cl}_2 + \text{I}^- \rightarrow \text{Cl}^- + \text{I}_2$ |

Extras for experts: write balanced equations for the following.

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|---|--|
| 11. $\text{Li} + \text{H}_2\text{O} \rightarrow \text{Li}^+ + \text{OH}^- + \text{H}_2$ | 12. $\text{Cu} + \text{NO}_3^- + \text{H}^+ \rightarrow \text{Cu}^{2+} + \text{NO}_2$ |
| 13. $\text{Cu} + \text{SO}_4^{2-} + \text{H}^+ \rightarrow \text{Cu}^{2+} + \text{SO}_2$ | 14. $\text{H}_2\text{O}_2 \rightarrow \text{H}_2\text{O} + \text{O}_2$ |
| 15. $\text{Cr}_2\text{O}_7^{2-} + \text{C}_2\text{H}_5\text{OH} \rightarrow \text{Cr}^{3+} + \text{CH}_3\text{CHO}$ | 16. $\text{Mg} + \text{H}_2\text{O} \rightarrow \text{Mg}^{2+} + \text{H}_2$ |
| 17. $\text{Cu}_2\text{O} \rightarrow \text{Cu} + \text{Cu}^{2+}$ | 18. $\text{Au} + \text{CN}^- + \text{O}_2 \rightarrow [\text{Au}(\text{CN})_4]^- + \text{H}_2\text{O}$ |

Answers

- $\text{Br}_2 + 2\text{I}^- \rightarrow 2\text{Br}^- + \text{I}_2$
- $\text{Cu} + 2\text{Ag}^+ \rightarrow \text{Cu}^{2+} + 2\text{Ag}$
- $\text{Mg} + \text{Pb}^{2+} \rightarrow \text{Mg}^{2+} + \text{Pb}$
- $\text{Mg} + 2\text{H}^+ \rightarrow \text{Mg}^{2+} + \text{H}_2$
- $2\text{Al} + 6\text{H}^+ \rightarrow 2\text{Al}^{3+} + 3\text{H}_2$
- $\text{Mg} + \text{Cu}^{2+} \rightarrow \text{Mg}^{2+} + \text{Cu}$
- $2\text{Al} + 3\text{Zn}^{2+} \rightarrow 2\text{Al}^{3+} + 3\text{Zn}$
- $\text{Cu} + 2\text{Fe}^{3+} \rightarrow \text{Cu}^{2+} + 2\text{Fe}^{2+}$
- $\text{Zn} + 2\text{Ag}^+ \rightarrow \text{Zn}^{2+} + 2\text{Ag}$
- $\text{Cl}_2 + 2\text{I}^- \rightarrow 2\text{Cl}^- + \text{I}_2$
- $2\text{Li} + 2\text{H}_2\text{O} \rightarrow 2\text{Li}^+ + 2\text{OH}^- + \text{H}_2$
- $\text{Cu} + 2\text{NO}_3^- + 4\text{H}^+ \rightarrow \text{Cu}^{2+} + 2\text{NO}_2 + 2\text{H}_2\text{O}$
- $\text{Cu} + \text{SO}_4^{2-} + 4\text{H}^+ \rightarrow \text{Cu}^{2+} + \text{SO}_2 + 2\text{H}_2\text{O}$
- $2\text{H}_2\text{O}_2 \rightarrow 2\text{H}_2\text{O} + \text{O}_2$
- $\text{Cr}_2\text{O}_7^{2-} + 8\text{H}^+ + 3\text{C}_2\text{H}_5\text{OH} \rightarrow 2\text{Cr}^{3+} + 3\text{CH}_3\text{CHO} + 7\text{H}_2\text{O}$
- $\text{Mg} + 2\text{H}_2\text{O} \rightarrow \text{Mg}^{2+} + \text{H}_2 + 2\text{OH}^-$
- $\text{Cu}_2\text{O} + 2\text{H}^+ \rightarrow \text{Cu} + \text{Cu}^{2+} + \text{H}_2\text{O}$
- $4\text{Au} + 16\text{CN}^- + 3\text{O}_2 + 12\text{H}^+ \rightarrow 4[\text{Au}(\text{CN})_4]^- + 6\text{H}_2\text{O}$