

Hydrogen Peroxide Redox Chemistry Explained

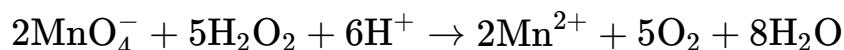
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Response: **Statement Analysis**

- **Left Statement (Assertion):** True.
 - Acidic MnO_4^- (purple) is reduced by H_2O_2 to Mn^{2+} (nearly colourless) while H_2O_2 is oxidized to $\text{O}_2(g)$.
 - Acidic Fe^{2+} (pale green) is oxidized by H_2O_2 to Fe^{3+} (yellow-brown) while H_2O_2 is reduced to H_2O .
- **Right Statement (Reason):** True.
 - H_2O_2 contains oxygen in the -1 oxidation state, allowing it to act as both a reducing agent (oxidized to O_2 , 0) and an oxidizing agent (reduced to H_2O , -2) in acidic media.

Chemical Equations

- **Reaction with Acidic MnO_4^- (Redox pair where H_2O_2 acts as a reducing agent):**



- **Reaction with Acidic Fe^{2+} (Redox pair where H_2O_2 acts as an oxidizing agent):**



Conclusion

Both statements are **True**, and the right statement (Reason) is the **correct explanation** for the left statement (Assertion).
