What Are Redox Reactions?

Worksheet

Redox reactions involve simultaneous oxidation and reduction: one reactant donates electrons while another accepts them. Always coupled-if something is oxidized, something else is reduced.

oxidation half: A A + e; reduction half: B + e B

Questions

1. In 2H + O 2HO, what is oxidized?

A) O
B) H
C) HO
D) Nothing

2. Which describes reduction?

A) Lose electrons
B) Gain electrons
C) Form new bonds
D) Absorb heat

3. Reducing agent is the

A) Species reduced
B) Species oxidized
C) Catalyst
D) Solvent

4. In Cl + 2Br 2Cl + Br, which oxidation state changes?

A) Only Cl
B) Only Br
C) Both Cl and Br
D) Neither

5. Balance: Cu + O CuO. Identify oxidation and reduction.

6. In Zn + Cu Zn + Cu, which species is oxidized?

7. In MnO + 8H + 5Fe Mn + 5Fe + 4HO, how many electrons transferred?

8. Define: What is oxidation?

9. Define: What is reduction?

10. Define: Can oxidation happen without reduction?

Answer Key

1. B) H - H: 0 +1 (loses electrons); H is oxidized.
2. B) Gain electrons - Reduction = electron gain; oxidation state decreases.
3. B) Species oxidized - Reducing agent provides electrons-it gets oxidized.
4. C) Both Cl and Br - Cl: 01 (reduced), Br: 10 (oxidized).
5. Cu: 0 +1 (loses 1e, oxidized) O: 0 2 (gains 2e, reduced) Balanced: 4Cu + O 2CuO Cu is reducing agent, O is oxidizing agent.
6. Zn: 0 +2 (loses 2e, oxidized) Cu: +2 0 (gains 2e, reduced) Zn is the reducing agent, Cu is oxidizing.
7. Mn: +7 +2 (gains 5e, reduced) Fe: +2 +3 (each loses 1e, 5 Fe 1 = 5e oxidized) Total electrons transferred: 5e.
8. Loss of electrons; oxidation state increases.
9. Gain of electrons; oxidation state decreases.
10. No-redox reactions always have both, paired together.