

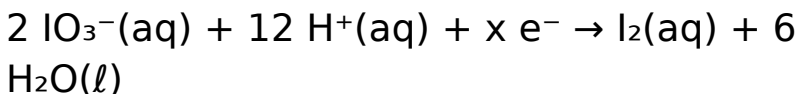
2023 Ch H1 Q14

Section: Chemical Changes and Structure

Topic: Redox

Question Summary

During a redox process in acid solution, iodate ions are converted into iodine.



What value of x is required to balance the equation?

A: 12

B: 11

C: 10

D: 6

Worked Solution

Step 1: Balance iodine atoms. On the left, 2 IO_3^- ions contain 2 iodine atoms. On the right, I_2 has 2 iodine atoms. Iodine is balanced.

Step 2: Balance oxygen atoms. Left side: $2 \times 3 = 6$ O atoms. Right side: 6 H_2O molecules contain 6 O atoms. Oxygen is

balanced.

Step 3: Balance hydrogen atoms. Right side: 6 H_2O molecules have 12 H. Left side: 12 H^+ provides 12 H. Hydrogen is balanced.

Step 4: Balance charge. Left side: 2 IO_3^- contributes -2 charge, plus 12 H^+ gives $+10$ overall. To balance with neutral right side, add 10 e^- . Therefore $x = 10$.

Final Answer

C — 10

Revision Tips

- Balance atoms first (except hydrogen and oxygen).
- Then balance oxygen with H_2O , hydrogen with H^+ , and charges with e^- .
- Redox balancing in acidic solution always follows this systematic process.