What is Electrolysis?

Worksheet

Electrolysis splits a compound into elements or ions using an electric current. An external power source (not the cell) drives the non-spontaneous reaction, making products that wouldn't form naturally.

Questions

1. In the electrolysis of water, which gas forms at the anode?

A) H
B) O
C) Cl
D) N

2. To deposit 2 mol of Cu (Cu + 2e Cu), how many moles of e?

A) 1 mol
B) 2 mol
C) 4 mol
D) 0.5 mol

3. If I = 10 A for 1 hour, what is the charge Q in Coulombs?

A) 10 C
B) 36000 C
C) 360000 C
D) 100 C

4. Electrolysis is spontaneous or non-spontaneous?

A) spontaneous
B) non-spontaneous
C) equilibrium
D) depends on Q

5. Electrolyse molten NaCl. Write anode and cathode reactions.

6. Calculate charge (in Coulombs) needed to deposit 1 mol of Cu from CuSO by electrolysis.

7. If 5 A of current flows for 1 hour, how many moles of electrons transferred?

8. Define: What is electrolysis?

9. Define: Which electrode is positive in electrolysis?

10. Define: Which electrode is negative in electrolysis?

Answer Key

1. B) O - Anode = oxidation of HO: 2HO O + 4H + 4e.
2. C) 4 mol - 2 electrons per Cu: 2 mol Cu 2 e/Cu = 4 mol e.
3. C) 360000 C - Q = It = 10 A 3600 s = 36000 C.
4. B) non-spontaneous - External power drives it - Ecell < 0, non-spontaneous without power.
5. Anode (oxidation): 2Cl Cl + 2e Cathode (reduction): Na + e Na Overall: 2NaCl 2Na + Cl
6. Cu + 2e Cu (2 electrons per Cu) Q = n F = 2 mol e 96485 C/mol = 192970 C
7. Q = I t = 5 A 3600 s = 18000 C n(e) = Q / F = 18000 / 96485 = 0.187 mol
8. The non-spontaneous decomposition of a compound using an external electrical power source.
9. The anode (where oxidation occurs).
10. The cathode (where reduction occurs).