Worksheet: Electrochemistry

NIOS · Class 12 · Chemistry · 11 questions · 33 marks

Name: _____ Date: _____ Score: _____ / 33

Q1. Write the cell notation and calculate the standard cell potential for the reaction Ni(s) + Cu2+(aq) gives Ni2+(aq) + Cu(s). Take E(Ni2+/Ni) = -0.25 V and E(Cu2+/Cu) = +0.34 V. *[2 marks]*

Q2. The conductivity of a 0.05 M solution of an electrolyte is 0.0035 S/cm at 298 K. Calculate its molar conductivity. *[2 marks]*

Q3. How many faradays are needed to deposit 1 mol of chromium from a solution containing Cr3+ ions? *[2 marks]*

Q4. Calculate the emf at 298 K of the cell Zn(s) | Zn2+(0.1 M) || Cu2+(0.01 M) | Cu(s), given E(cell, standard) = 1.10 V. *[3 marks]*

Q5. For a cell reaction transferring 2 electrons, E(cell, standard) = 0.46 V at 298 K. Find the standard Gibbs energy and the equilibrium constant. *[3 marks]*

Q6. The limiting molar conductivities of NaCl, HCl and CH3COONa are 126.4, 425.9 and 91.0 S cm2/mol. Find the limiting molar conductivity of acetic acid. *[3 marks]*

Q7. A current of 2 amperes is passed through molten AlCl3 for 30 minutes. What mass of aluminium is deposited? Take Al = 27. *[3 marks]*

Q8. Write the anode and cathode reactions of the hydrogen-oxygen fuel cell in alkaline medium and state its overall reaction. *[3 marks]*

Q9. The emf of the cell Zn(s) | Zn2+(x M) || Cu2+(1.0 M) | Cu(s) is 1.16 V at 298 K, and E(cell, standard) is 1.10 V. Calculate x. *[4 marks]*

Q10. The molar conductivity of 0.1 M acetic acid is 5.2 S cm2/mol and its limiting molar conductivity is 390.5 S cm2/mol. Find the degree of dissociation, the dissociation constant and the pH of the solution. *[4 marks]*

Q11. Using Table 2.1, decide whether an aqueous solution of Fe3+ can oxidise both I- and Br-, and explain the difference between the two cases. *[4 marks]*