***Chemistry***

**17: Electrochemistry**

**17.2: Galvanic Cells**

13. Write the following balanced reactions using cell notation. Use platinum as an inert electrode, if needed.

(a) 

(b) 

(c) 

(d) 

Solution

(a) ; (b) Stoichiometric coefficients do not appear in cell notation ; (c) Spectator ions do not appear in cell notation  (d) Neither stoichiometric coefficients nor spectator ions appear in cell notation. Platinum electrode needed 

15. For the cell notations in the previous problem, write the corresponding balanced reactions.

Solution

(a) ; (b) 

17. Identify the species oxidized, species reduced, and the oxidizing agent and reducing agent for all the reactions in the previous problem.

Solution

Species oxidized = reducing agent: (a) Al(*s*); (b) NO(*g*); (c) Mg(*s*) and (d) MnO2(*s*). Species reduced = oxidizing agent: (a) Zr4+(*aq*); (b) Ag+(*aq*); (c) (*aq*); and (d) (*aq*).

19. Why is a salt bridge necessary in galvanic cells like the one in Figure 17.4?

Solution

Without the salt bridge, the circuit would be open (or broken) and no current could flow. With a salt bridge, each half-cell remains electrically neutral and current can flow through the circuit.

21. An active (metal) electrode was found to lose mass as the oxidation-reduction reaction was allowed to proceed. Was the electrode part of the anode or cathode? Explain.

Solution

Active electrodes participate in the oxidation-reduction reaction. Since metals form cations, the electrode would lose mass if metal atoms in the electrode were to oxidize and go into solution. Oxidation occurs at the anode.

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e it only provided a way for current to flow through the cell.