Electrochemistry

Here are **30 key terms and their definitions** related to **Electrochemistry**:

1. **Electrochemistry**: The branch of chemistry that deals with the relationship between electrical energy and chemical reactions.
2. **Electrochemical Cell**: A device that generates electrical energy from chemical reactions or uses electrical energy to cause chemical changes.
3. **Galvanic Cell**: A type of electrochemical cell that generates electrical energy from spontaneous redox reactions.
4. **Electrolytic Cell**: An electrochemical cell that uses electrical energy to drive non-spontaneous chemical reactions.
5. **Electrode**: A conductor through which electric current enters or leaves an electrochemical cell.
6. **Anode**: The electrode where oxidation (loss of electrons) occurs in an electrochemical cell.
7. **Cathode**: The electrode where reduction (gain of electrons) occurs in an electrochemical cell.
8. **Electrolyte**: A substance that dissociates into ions in solution, allowing the solution to conduct electricity.
9. **Electrode Potential**: The ability of an electrode to gain or lose electrons, measured in volts.
10. **Standard Electrode Potential (E°)**: The electrode potential of a half-cell under standard conditions (1 M concentration, 298 K temperature, and 1 atm pressure).
11. **Nernst Equation**: A mathematical equation that relates the electrode potential to the concentrations of the reactants and products in a cell.
12. **Electrochemical Series**: A list of elements arranged in order of their standard electrode potentials.
13. **Cell Potential (EMF)**: The voltage difference between two electrodes in an electrochemical cell.
14. **Salt Bridge**: A device used in galvanic cells to maintain electrical neutrality by allowing the flow of ions between two half-cells.
15. **Faraday's Laws of Electrolysis**: Laws that quantify the relationship between the amount of substance produced or consumed at an electrode and the quantity of electric charge passed through the cell.

16. **Faraday (Unit)**: The amount of electric charge carried by one mole of electrons, approximately equal to 96,485 coulombs.

17. **Electroplating**: A process in which a metal is deposited onto a surface by passing an electric current through an electrolytic solution.

18. **Electrolysis**: The process of using electrical energy to drive a non-spontaneous chemical reaction.

19. **Redox Reaction**: A reaction in which oxidation and reduction occur simultaneously, involving the transfer of electrons.

20. **Oxidation**: The loss of electrons by a species in a chemical reaction.

21. **Reduction**: The gain of electrons by a species in a chemical reaction.

22. **Molar Conductivity**: The conductance of an electrolyte solution divided by its concentration, used to compare the conductive abilities of different electrolytes.

23. **Specific Conductance (Conductivity)**: The ability of an electrolyte solution to conduct electricity, measured in siemens per meter (S/m).

24. **Kohlrausch's Law**: A law that states the limiting molar conductivity of an electrolyte is the sum of the contributions of its individual ions.

25. **Primary Cell**: A non-rechargeable electrochemical cell that provides energy until its reactants are used up (e.g., a dry cell or alkaline battery).

26. **Secondary Cell**: A rechargeable electrochemical cell, such as a lead-acid battery, which can be recharged and used multiple times.

27. **Fuel Cell**: An electrochemical cell that generates electricity through the continuous reaction of a fuel (such as hydrogen) with an oxidant (such as oxygen).

28. **Overpotential**: The extra voltage required in an electrolytic cell to drive a non-spontaneous reaction beyond its theoretical value.

29. **Corrosion**: The deterioration of a metal as a result of chemical reactions with its environment, often involving electrochemical processes.

30. **Standard Hydrogen Electrode (SHE)**: A reference electrode with a defined potential of 0 volts, used as a standard for measuring electrode potentials in electrochemical cells.

These terms cover the fundamental concepts and processes involved in electrochemistry, which are important for understanding electrochemical cells, reactions, and applications.