

Review for Third Exam:

Chapter 17

Neutralization (acid-base) reactions; strong acid-strong base; strong acid-weak base, and weak acid-strong base neutralization

Buffers; definition; how buffers work; buffer reactions

Calculations involving buffers

The Henderson equation and its uses

Titration and titration calculations; equivalence point

Indicators; acid-base properties of indicators; end point of titration; choice of indicators in titrations

Strong acid-strong base titration; strong acid-weak base titration; strong base-weak acid titration

Relationship between pH at half-equivalence point and pK_a or pK_b

Titration curve for polyprotic acids

Soluble and insoluble

Solubility product (K_{sp}), definition

Relationship between solubility product, molar solubility, and solubility by mass

Use of the solubility product in calculations

Factors affecting solubility (temperature, pH, common ion effect)

Solubility and the reaction quotient; unsaturated, saturated, supersaturated

Selective precipitation

Complex ion formation

Chapter 18

Oxidation number; interpretation; rules for assigning oxidation numbers (see section 9.4)

Oxidation-reduction (redox) reactions

Oxidation and reduction; oxidizing agent and reducing agent

Balancing oxidation-reduction reactions for acid and base conditions

Electrochemical cells; galvanic cells (batteries); electrolytic cells

Anode (oxidation reaction) and cathode (reduction reaction)

Anode (-) and cathode (+) for galvanic cells

Salt bridge

Cell notation for representing galvanic cells

SHE (standard hydrogen electrode)

Standard cell potential (E°); effect of changing a reaction on the value for E°

Find the standard cell potential (E°_{cell})

Relationship between E_{cell} and ΔG_{rxn}

Relationship between the sign of E_{cell} and spontaneous reaction

The electrochemical series and its use to predict spontaneous and nonspontaneous reactions

The Nernst equation and its use in calculating E_{cell}

Finding K (equilibrium constant) from electrochemical data

Electrolytic cells; anode (+) and cathode (-) for electrolytic cells

Calculations involving electrolytic cells