

## Chapter 14 Assignments

The following problems will be collected at the first exam.

Review Questions: 3, 6, 7, 10, 14

Problems: 27, 29, 31, 35, 37, 41, 45, 51, 53, 55, 61, 67, 69, 75, 77, 90, 104, 112

### Exam Review Topics

#### terms

Catalyst  
Reaction rate  
Rate constant  
Reaction order  
Half-life  
Activation energy  
Activated complex  
Reaction mechanism  
Molecularity  
Rate determining step

#### skills/operations

Calculating average reaction rate  
Determining reaction order from Rate Law  
Determining Rate Law from initial rates  
Concentration-time equation for first-order reactions  
Relating  $t_{1/2}$  to rate constant  
Find overall equation from a mechanism  
Write rate equation for an elementary reaction  
Determining Rate Law from a mechanism

## Chapter 15 Assignments

The following problems will be collected at the first exam.

Review Questions: 3, 4, 7, 12, 17, 20

Problems: 21, 27, 29, 31, 33, 35, 37, 39, 41, 43, 49, 53, 57, 59, 63, 67, 69, 80, 84, 90

### Exam Review Topics

#### terms

Chemical Equilibrium  
Equilibrium-constant Expression  
Equilibrium Constant  
Law of Mass Action  
Homogeneous Equilibrium  
Heterogeneous Equilibrium  
Reaction Quotient  
Le Chatelier's Principle

#### skills/operations

Applying Stoichiometry to an Equilibrium Mixture  
Writing Equilibrium-constant Expressions  
Obtaining an Equilibrium Constant from Molarities  
Using the Reaction Quotient  
Solving Equilibrium Problems  
Applying Le Chatelier's Principle

## Chapter 16 Assignments

The following problems will be collected at the second exam.

Review Questions: 4, 6, 10, 15, 22, 28

Problems: 33, 35, 37, 45, 49, 53, 59, 63, 69, 71, 75, 76, 83, 87, 93, 97, 101, 105, 110, 113, 117, 119, 120, 123

### Exam Review Topics

#### terms

Bronsted-Lowry acid/base  
 Conjugate acid base pair  
 Conjugate acid-base pair  
 Amphoteric  
 Lewis Acid/base  
 Polyprotic acids  
 Acid/Base Ionization Constants  
 Hydrolysis  
 Common Ion Effect  
 Buffer  
 Self-ionization  
 Ion-product constant for water  
 pH, pOH

#### skills/operations

Identifying acids and bases  
 Identifying Lewis acids and bases  
 Determining relative strengths of acids and bases  
 Calculating  $[H^+]$  and  $[OH^-]$   
 Calculating pH and pOH  
 Determining  $K_a$  (and  $K_b$ ) from solution pH.  
 Calculating Concentration at Equilibrium.  
 Predicting Acidity/Basicity of Salts.  
 Obtaining  $K_a$  from  $K_b$  or  $K_b$  from  $K_a$ .  
 Common Ion Effects on Acid Ionization.

## Chapter 17 sec. 17.1 thru 17.4 Assignments

The following problems will be collected at the second exam.

Review Questions: 3, 6, 10

Problems: 27, 33, 37, 41, 43, 48, 50, 57, 69, 72

### Exam Review Topics

#### terms

Acid Ionization Constant  
 Base Ionization Constant  
 Hydrolysis  
 Common Ion Effect  
 Buffer  
 Henderson-Hasselbalch Equation  
 Acid-Base Titration Curve  
 Equivalence Point

#### skills/operations

Determining  $K_a$  (and  $K_b$ ) from solution pH.  
 Calculating Concentration at Equilibrium.  
 Predicting Acidity/Basicity of Salts.  
 Obtaining  $K_a$  from  $K_b$  or  $K_b$  from  $K_a$ .  
 Common Ion Effects on Acid Ionization.  
 Calculating pH of a Buffer.  
 Calculating Titration Curve pH's.

## Chapter 17 sections 17.5-17.8 Assignments

The following problems will be collected at the third exam.

Review Questions: 22

Problems: 85, 88, 89, 92, 95, 97, 99, 101, 105, 109, 112

### Exam Review Topics

#### terms

Solubility Product Constant  
Ion Product,  $Q_c$   
Fractional Precipitation  
Complex Ion  
Ligand  
Formation Constant,  $K_f$   
Dissociation Constant,  $K_d$

#### skills/operations

Writing Solubility Product Expressions  
Calculating  $K_{sp}$  from Solubility  
Calculating Solubility from  $K_{sp}$   
Calculating Solubility in presence of Common Ion  
Predicting Precipitation  
Determining Effect of pH on Solubility

## Chapter 18 Assignments

The following problems will be collected at the third exam.

Review Questions: 4, 12, 15, 21

Problems: 27, 35, 45, 47, 53, 55, 59, 65, 74, 78, 82

### Exam Review Topics

#### terms

Internal Energy, U  
Work  
Three Laws of Thermodynamics  
Enthalpy, H  
Entropy, S  
Free Energy, G  
Thermodynamic Equilibrium Constant, K

#### skills/operations

Calculating the Entropy Change for Phase Transitions.  
Predicting the Sign of the Entropy Change in a Reaction.  
Calculating  $\Delta S^\circ$  for a Reaction.  
Calculating  $\Delta G^\circ$  from  $\Delta H^\circ$  and  $\Delta S^\circ$ .  
Calculating  $\Delta G^\circ$  from Standard Free Energies of Formation.  
Interpreting the Sign of  $\Delta G^\circ$ .  
Calculating K from the Standard Free Energy Change.  
Calculating  $\Delta G^\circ$  and K at Various Temperatures.

## Chapter 19 Assignments

The following problems will be collected at the fourth exam.

Review Questions: 4, 20, 31

Problems: 39, 41, 49, 53, 55, 57, 61, 66, 69, 74, 75, 87, 99, 102

### Exam Review Topics

#### terms

oxidation/reduction  
voltaic cell  
electrolytic cell  
half-cell  
salt bridge  
anode/cathode  
volt  
Faraday's constant  
standard emf  
standard electrode potential  
Nernst equation  
ampere

#### skills/operations

Sketch/label voltaic cell  
Cell reaction from cell notation  
Maximum work  
Calculate standard cell emf  
Calculate  $\Delta G^\circ$  from  $E^\circ$   
Calculating  $E^\circ$  from  $\Delta G^\circ$   
Calculate  $E_{\text{cell}}$  at nonstandard conditions  
Calculating  $K$  from  $E_{\text{cell}}$   
Relating amount of charge and product in electrolysis

## Chapter 20 Assignments

The following problems will be collected at the fourth exam

Review Questions: 5, 6, 7, 10

Problems: 31, 35, 37, 41, 45, 47, 51, 57, 60, 65, 68, 74

### Exam Review Topics

#### terms

Radioactive decay	Electron volt
Nuclear equation	Metastable nucleus
Shell model of the nucleus	Activity
Magic numbers	Rad
Alpha emission	Rem
Beta emission	Curie
Gamma emission	Half-life
Electron capture	Decay constant
Transmutation	Binding energy
Electron volt	Fission/fusion

#### skills/operations

Writing nuclear equations  
Deducing the product/reactant in a nuclear equation  
Predicting stability of nuclides (magic numbers)  
Predicting type of radioactive decay  
Using notation for bombardment reactions  
Calculations involving "k" and " $t_{1/2}$ "  
Determining fraction of nuclei remaining  
Calculating energy change for a nuclear reaction