Review for the General Chemistry Final Exam
Second Semester Part 1 of 3

Parts 1 – 8 of the review (Questions 1 – 96) covers first semester topics. If you are taking the 2nd semester exam, start here. If you are taking the full year exam, start with the First Semester Review, Parts 1 – 3.

Part 9. Liquids and Solids

97. Which choice best indicates the degree of correctness of this statement? *"Water at 50° C would boil if the opposing pressure were reduced to 90 mmHg by means of a vacuum pump."*

Vapor Pressure of Substances in mmHg

temperature	0 °C	20 °C	50 °C	80 °C
n-propanol	3.4	14.5	87.2	376
water	4.6	17.6	92.0	355
turpentine	2.1	4.4	17.0	61.3

(A) The statement is true.

(B) The statement is probably true; additional data would be needed for a final decision.

(C) It is impossible to judge the statement because the data are insufficient.

(D) The statement is probably false; additional data would be needed for a final decision.

(E) The statement is false.

98. The normal boiling point of SO_2 is 263.1 K and that of NH_3 is 239.7 K. At –40 °C which would you predict?

(A) Ammonia has the greater vapor pressure.

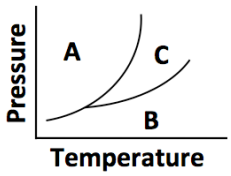
(B) Sulfur dioxide has the greater vapor pressure.

(C) The vapor pressures would be equal.

(D) The vapor pressure of NH_3 is 760 mmHg.

(E) The relative vapor pressures are not predictable from the data given.

99. Consider the phase diagram of a pure compound. Which statement applies?



(A) The path **A** → **C** represents sublimation.

(B) Following the path **A** → **B** → **C** the compound would first liquefy and then vaporize.

(C) If the compound is in state **A**, continued reduction of the pressure (at constant temperature) will cause it to melt.

(D) None of these statements is correct.

100. A pure substance, above its melting point, is in a high pressure cylinder. Upon opening a valve on the cylinder a gas escapes. A pressure gauge on the cylinder shows a pressure of 56.5 atm. at 20 °C before opening the valve. After removing 10 ft^3 of the gas, measured at standard conditions, the pressure in the cylinder reads 56.5 atm at 20 °C. The pressure gauge is in good working order. Which best explains these observations?

(A) The cylinder and contents will weigh the same before and after opening the valve.

(B) The substance in the cylinder is in the gaseous state.

(C) The substance in the cylinder is mostly in the liquid state.

(D) The substance in the cylinder has diatomic molecules when in the gaseous state.

(E) The substance in the cylinder is oxygen.

101. Carbon dioxide, CO_2, in the form of dry ice would be classified as

(A) an ionic solid. (C) a molecular solid.
(B) a polymeric solid. (D) a metallic solid.

102. A crystal of anhydrous KNO_3 is made up of

(A) molecules of KNO_3.

(B) atoms of potassium, nitrogen, and 3 atoms of oxygen alternately spaced in the crystal.

(C) a geometrical pattern of potassium ions and nitrate ions in the crystal.

(D) potassium nitrate molecules alternately spaced with water molecules.

(E) molecules of KNO_3 and water combined into larger molecules.

103. Which group of substances is correctly arranged in order from the highest to the lowest melting point?

(A) HF > H_2 > NaF (C) NaF > H_2 > HF

(B) HF > NaF > H_2 (D) NaF > HF > H_2

104. Arrange KCl, NH_3, and CH_4 in order of increasing boiling point.

(A) CH_4 < KCl < NH_3 (C) NH_3 < KCl < CH_4

(B) CH_4 < NH_3 < KCl (D) NH_3 < CH_4 < KCl

105. The edge of a unit cube of an element **Y**, containing two atoms per unit cube, was found (by X–ray diffraction) to be 3.16 x 10^{-8} cm. The density of the metal is 19.35 g·cm^{-3}. What is the approximate atomic molar mass of **Y**?

(A) 65.4 (B) 92.0

(C) 184 (D) 238

106. How many nearest neighboring sodium ions does each chloride ion have in NaCl*(s)*?

(A) 1 (B) 4

(C) 6 (D) 8

107. A particular compound has a crystal lattice with a cubic unit cell with atoms **A** in the corner positions and atoms **B** in the body–centered position. The simplest formula for the compound is

(A) $\mathbf{A_4B}$ (B) $\mathbf{A_2B}$

(C) **AB** (D) $\mathbf{A_8B}$

Part 10. Solutions

108. Which substance is most soluble in water?

(A) C_6H_6 (C) $CaCO_3$

(B) C_2H_5OH (D) CO_2

109. Liquid **Q** is a polar solvent and liquid **R** is a nonpolar solvent. On the basis of this information you would expect

(A) both liquids to be miscible with a third liquid **T**.

(B) liquid **Q** and H_2O to be miscible.

(C) liquid **Q** to be miscible with liquid **R**.

(D) CCl_4 to be immiscible with both **Q** and **R**.

(E) NaCl to be soluble in both **Q** and **R**.

110. A cellophane bag, which acts as a membrane permeable only to water, contains a 2 M sugar solution. The bag is immersed in a 1 M sugar solution. What will happen?

(A) The bag will soon contain more solution that will be are concentrated than 2 M.

(B) The bag will soon contain more solution that will be less concentrated than 2 M.

(C) The bag will lose sugar and the solution in it will become less concentrated.

(D) The bag will lose water and the solution in it will become more concentrated.

(E) There will be no change.

111. Which statement correctly expresses a relation between solubility and temperature?

(A) An increase in temperature increases the solubility of a gas in a liquid.

(B) The change of solubility with temperature is the same for all substances.

(C) The solubility of a liquid in a liquid is independent of temperature.

(D) The solubility of most solids in water increases with increasing temperature.

(E) The solubility of most solids in water decreases with increasing temperature.

112. The solubility of a substance is 60 g per 100 mL water at 15 °C. A solution of the same substance is prepared by dissolving 75 g per 100 mL water at 75 °C and then is cooled slowly to 15 °C without any solid separating. The solution is

(A) supersaturated at 75 °C.

(B) supersaturated at 15 °C.

(C) unsaturated at 15 °C.

(D) saturated at 15 °C.

113. If 0.400 g of a substance **R** is dissolved in 100 g of liquid **Q**, what is the molality of the solution? Given: Molar mass of R = 80.0 g·mol^{-1}

(A) 4.00 x 10^{-3} *m* (C) 5.00 x 10^{-2} *m*

(B) 5.00 x 10^{-3} *m* (D) 4.00 x 10^{-1} *m*

114. What mass of water is needed to dissolve 292.5 g of NaCl to produce a 0.25 *m* aqueous solution? Given: Molar mass of NaCl = 58.5 g mol^{-1}

(A) 20 kg (B) 5.0 kg

(C) 0.80 kg (D) 0.050 kg

115. What is the mole fraction of water in 200. g of 95% (by mass) ethanol, C_2H_5OH?

Given: Molar mass of C_2H_5OH = 46.0 g mol^{-1}

(A) 0.050 (B) 0.12
(C) 0.56 (D) 0.88

116. Which aqueous solution has the ***smallest*** freezing point depression?

(A) 0.2 *m* $Ca(NO_3)_2$ (C) 0.2 *m* $MgSO_4$
(B) 0.2 *m* CH_3OH (D) 0.2 *m* K_3PO_4

117. A 2.00-g sample of a non-electrolyte is dissolved in 100 g H_2O. If the resulting solution freezes at - 0.186 °C, what is the molar mass of the compound?

Molal Freezing Point Constant
K_f for water = 1.86 °C m^{-1}

(A) 18.6 g mol^{-1} (B) 20.0 g mol^{-1}
(C) 186 g mol^{-1} (D) 200 g mol^{-1}

118. What is the molar mass of a non-volatile molecular solute if 120 g of it dissolved in 500 g of water causes the solution to boil at 101.04 °C at atmospheric pressure?

Molal Boiling Point Constant
K_b for water = 0.52 °C m^{-1}

(A) 60 g mol^{-1} (B) 120 g mol^{-1}
(C) 240 g mol^{-1} (D) 300 g mol^{-1}

119. Assuming ideal behavior, what is the vapor pressure of a solution of 16.0 mol of carbon tetrachloride and 4.00 mol of dioxane at 23 °C?

Vapor Pressures at 23 °C	
carbon tetrachloride	100. mmHg
dioxane	38.0 mmHg

(A) 50.4 mmHg (C) 74.2 mmHg
(B) 62.8 mmHg (D) 87.6 mmHg

Part 11. Kinetics

120. A change in temperature from 10 °C to 20 °C is found to double the rate of a given chemical reaction. How did this change affect the reacting molecules?

(A) It doubled their average velocity.

(B) It doubled their average energy.

(C) It doubled the number of collisions per second.

(D) It doubled the proportion of molecules possessing at least the minimum energy required for the reaction.

121. The rate equation for a chemical reaction is determined by

(A) theoretical calculations.

(B) measuring reaction rate as a function of concentration of reacting species.

(C) determining the equilibrium constant for the reaction.

(D) measuring reaction rates as a function of temperature.

122. The value of the rate constant of a reaction can generally be expected to

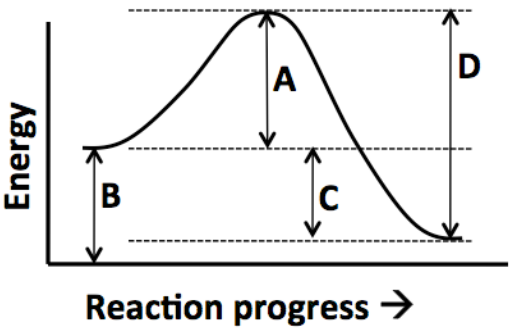
(A) be independent of temperature.

(B) increase with increasing temperature.

(C) decrease with increasing temperature.

(D) decrease with increasing temperature only if the reaction is exothermic.

123. Which line in the diagram represents the activation energy for a forward reaction?



(A) **A** (B) **B** (C) **C** (D) **D**

124. The rate law for the reaction

$$\mathbf{A} + \mathbf{B} \rightarrow \mathbf{C} + \mathbf{D}$$

is first order in [**A**] and second order in [**B**]. If [**A**] is halved and [**B**] is doubled, the rate of the reaction will

(A) remain the same.

(B) be increased by a factor of 2.

(C) be increased by a factor of 4.

(D) be increased by a factor of 8.

125. In a chemical reaction involving the formation of an intermediate activated complex, which step must always be exothermic?

(A) Reactants → products

(B) Products → reactants

(C) Reactants → activated complex

(D) Products → activated complex

(E) Activated complex → products

126. The gas–phase reaction, $\mathbf{A}_2 + \mathbf{B}_2 \rightarrow 2\mathbf{AB}$, proceeds by bimolecular collisions between $\mathbf{A}_2$ and $\mathbf{B}_2$ molecules. If the concentrations of both $\mathbf{A}_2$ and $\mathbf{B}_2$ are doubled, the reaction rate will be changed by a factor of

(A) ½ (B) 2 (C) 3 (D) 4 (E) $2^{1/2}$

127. The best ***experimental*** evidence for the assertion that molecules of higher-than-average kinetic energy are involved in chemical reactions is that

(A) all chemical reactions increase in rate by a increase in temperature.

(B) at the same temperature light molecules have a higher average velocity than heavy molecules.

(C) collision between molecules will not result in reaction unless enough energy is available to activate the particles.

(D) an increase in temperature causes an increase in the rate.

(E) a large rise in the average kinetic energy of molecules is caused by a small rise in temperature.

128. Given that

$$2\ SO_2(g) + O_2(g) \rightarrow 2\ SO_3(g)$$

the forward reaction is proceeding at a certain rate at some temperature and pressure; when the pressure is increased, we may expect for the forward reaction

(A) a greater rate of reaction and a greater yield of SO_3 at equilibrium.

(B) a greater rate of reaction and the same yield of SO_3 at equilibrium.

(C) a lesser rate of reaction and a lesser yield of SO_3 at equilibrium.

(D) a lesser rate of reaction and a greater yield of SO_3 at equilibrium.

(E) no change in rate or yield.

129. The addition of a catalyst in a chemical reaction

(A) increases the concentration of products at equilibrium.

(B) increases the fraction of reactant molecules with a given kinetic energy.

(C) provides an alternate path with a different activation energy.

(D) lowers the enthalpy change in the overall reaction.

130. A catalyst will

(A) alter the pathway (mechanism) of a chemical reaction.

(B) increase ΔH for the reaction.

(C) decrease ΔH for the reaction.

(D) decrease E_a for the forward reaction only

131. The following mechanism has been proposed for the formation of ethylbenzene:

$$CH_3CH_2Br + AlBr_3 \rightarrow AlBr_4^- + CH_3CH_2^+$$

$$CH_3CH_2^+ + C_6H_6 \rightarrow C_6H_6CH_2CH_3^+$$

$$C_6H_6CH_2CH_3 + AlBr_4^- \rightarrow AlBr_3 + HBr + C_6H_5CH_2CH_3$$

Which substance serves as the catalyst?

(A) $AlBr_3$ (C) $CH_3CH_2^+$

(B) $AlBr_4^-$ (D) $C_6H_6CH_2CH_3^+$

132. The table presents data for the reaction:

$$2\ H_2(g) + 2\ NO(g) \rightarrow 2\ H_2(g) + 2\ N_2(g)$$

The temperature of the reaction is constant. The initial rate is in arbitrary units.

Ex	Init. Conc. $[NO]_o$*	Init. Conc. $[H_2]_o$*	Initial rate $\Delta[\mathbf{N}_2]/\ \Delta t$
I	6.0 mol/L	1.0 mol/L	18.0
II	6.0	2.0	36.0
III	1.0	6.0	3.0
IV	2.0	6.0	12.0

* x 10^{-3} mol/L

What is the rate law for this reaction?

(A) rate = $k_1\ [H_2]\ [NO]$

(B) rate = $k_1\ [H_2]^2\ [NO]^2$

(C) rate = $k_1\ [H_2]^2\ [NO]$

(D) rate = $k_1\ [H_2]\ [NO]^2$

133. The reaction 2 **A** + 2 **B** → **C** + **D** proceeds by this mechanism:

Step 1. 2 **A** → $\mathbf{A}_2$ (equilibrium)

Step 2. $\mathbf{A}_2$ + **B** → **X** + **C** (rate determining)

Step 3. **X** + **B** → **D** (rapid)

The rate equation for the reaction is

(A) rate = $k[A]\ [B]$

(B) rate = $k[A]^2\ [B]^2$

(C) rate = $k\ [A]^2\ [B]^2\ [C]^{-1}\ [D]^{-1}$

(D) rate = $k[A]^2\ [B]$

134. Substance **A** undergoes a first order reaction **A** → **B** with a half life of 20 min at 25 °C. If the initial concentration of **A** in a sample is 1.6 M, what will be the concentration of **A** after 80 min?

(A) 0.40 M (B) 0.20 M

(C) 0.10 M (D) 0.050 M

135. The rate law for a first order reaction has the form

(A) rate = k (C) rate = $k\ [A]^2$

(B) rate = $k\ [A]$ (D) rate = $k\ [A]\ [B]$

136. For the reaction **A** + 2 **B** → $\mathbf{AB}_2$, given this data:

Expt.	Init. Conc. $[A]_o$ (mol/L)	Init. Conc. $[B]_o$ (mol/L)	Initial rate $\Delta[\mathbf{AB}_2]/\ \Delta t$
1	0.10	0.10	0.0090
2	0.20	0.10	0.036
3	0.10	0.20	0.018

What is the rate equation?

(A) rate = $k\ [A]\ [B]$

(B) rate = $k\ [A]^2\ [B]$

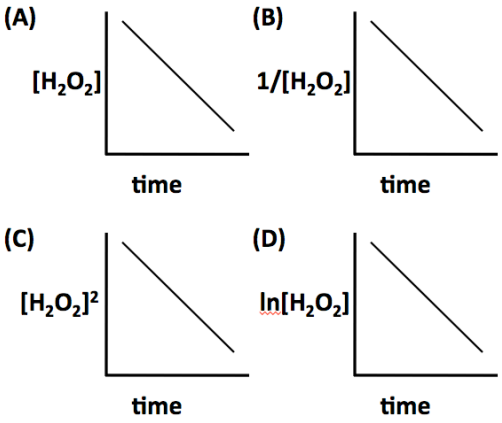
(C) rate = $k\ [A]\ [B]^2$

(D) rate = $k\ [A]^2\ [B]^2$

137. For the reaction

$$2H_2O_2 \rightarrow 2H_2O + O_2$$

which plot confirms that the rate is first order with respect to H_2O_2?



138. The decomposition of hydrogen peroxide in the presence of iodide ion is believed to occur via the mechanism

$$H_2O_2(aq) + I^-(aq) \rightarrow H_2O(l) + IO^-(aq)$$

$$H_2O_2(aq) + IO^-(aq) \rightarrow H_2O(l) + O_2(g) + I^-(aq)$$

In this mechanism, $I^-(aq)$ is

(A) a catalyst.

(B) a reactant in the overall reaction.

(C) the activated complex.

(D) a product of the overall reaction.

139. Consider the reaction:

$$2\ NO_2(g) + F_2(g) \rightarrow 2\ NO_2F(g)$$

A proposed mechanism for this reaction is

$$NO_2 + F_2 \rightleftharpoons NO_2F + F \quad \text{(slow)}$$

$$NO_2 + F \rightleftharpoons NO_2F \quad \text{(fast)}$$

What is the rate law for this mechanism?

(A) rate = $k\ [NO_2F]^2\ [NO_2]^{-2}\ [F_2]^{-1}$

(B) rate = $k\ [NO_2]^2\ [F_2]$

(C) rate = $k\ [NO_2]\ [F_2]$

(D) rate = $k\ [NO_2]\ [F]$

Part 12. Equilibrium

140. In which reaction will an increase in total pressure at constant temperature favor formation of the products?

(A) $CaCO_3(s) \rightarrow CaO(s) + CO_2(g)$

(B) $H_2(g) + Cl_2(g) \rightarrow 2\ HCl(g)$

(C) $2\ NO(g) + O_2(g) \rightarrow 2\ NO_2(g)$

(D) $COCl_2(g) \rightleftharpoons CO(g) + Cl_2(g)$

141. At constant temperature, an increased pressure applied to the equilibrium system

$$N_2(g) + 3\ H_2(g) \rightarrow 2\ NH_3(g)$$

will produce what change?

(A) increase the concentration and amount of NH_3

(B) increase the concentration and amount of H_2

(C) reduce the partial pressure of NH_3

(D) cause crystallization of NH_3

142. The equilibrium constant for the gaseous reaction

$$\mathbf{C} + \mathbf{D} \rightarrow \mathbf{E} + 2\ \mathbf{F}$$

Is 3.0 at 50 °C. In a 2.0 L flask at 50 °C are placed 1.0 mol of **C**, 1.0 mol of **D**, 1.0 mol of **E**, and 3.0 mol of **F**. Initially, the reaction will

(A) proceed at equal rates in both directions.

(B) proceed more rapidly to form **E** and **F**.

(C) proceed more rapidly to form **C** and **D**.

(D) not occur in either direction.

143. Consider this reaction.

$$NO(g) + CO(g) \rightarrow \tfrac{1}{2}\ N_2(g) + CO_2(g) \quad \Delta H = -374\ kJ$$

The conditions of temperature and pressure that favor the formation of CO_2 are

(A) high *T* and high *P*.

(B) high *T* and low *P*.

(C) low *T* and high *P*.

(D) low *T* and low *P*.

144. If the following reaction is carried out at constant volume, the concentration of O_2 at equilibrium will increase if

$$2\ SO_2(g) + O_2(g) \rightarrow 2\ SO_3(g) \quad \Delta H = -198\ kJ$$

(A) SO_2 is added to the system.

(B) SO_3 is added to the system.

(C) the temperature of the system is lowered.

(D) an inert gas is added to the system.

145. At 298 K the equilibrium constant for

$$H_2(g) + \tfrac{1}{2}\ O_2(g) \rightleftharpoons H_2O(l)$$

Compound	$\Delta G°_f$ (kJ/mol)
$H_2O(l)$	–237
$H_2O(g)$	–229

(A) is larger than the K_{eq} for $H_2(g) + \tfrac{1}{2}\ O_2(g) \rightleftharpoons H_2O(g)$

(B) will have a value of 1.0 at equilibrium.

(C) cannot be computed since data on O_2 and H_2 are not provided.

(D) will have the same value as the K_{eq} for $H_2(g) + \tfrac{1}{2}\ O_2(g) \rightleftharpoons H_2O(g)$

146. Which factor would cause a change in the equilibrium constant, K_c, for this reaction?

$$2\ NOCl(g) \rightleftharpoons 2\ NO(g) + Cl_2(g)$$

(A) adding NO(g)

(B) decreasing the volume of the reaction vessel

(C) cooling the system

(D) adding an inert gas

147. If the system

$$H_2(g) + I_2(g) \rightleftharpoons 2\ HI(g)$$

is initially at equilibrium, the amount of HI present in the equilibrium mixture at constant temperature could be increased by

(A) increasing the concentration of H_2 present.

(B) increasing the pressure on the mixture.

(C) adding a catalyst.

(D) lowering the concentration of I_2.

(E) increasing the volume of the reaction vessel.

148. In the equilibrium

$$HS^- + H_2O \rightleftharpoons 2\ H_3O^+ + S^{2-}$$

the addition of what ion would effectively ***increase*** the S^{2-} concentration?

(A) H_3O^+ (B) Br^-

(C) Cl^- (D) OH^-

(E) Na^+

149. Which is a proper description of chemical equilibrium?

(A) The frequencies of reactant and of product collisions are identical.

(B) The concentrations of products and reactants are identical.

(C) The velocities of product and reactant molecules are identical.

(D) Reactant molecules are forming products as fast as product molecules are reacting to form reactants.

(E) The numbers of moles of reactants and products are equal.

150. The value of the equilibrium constant *K* for a reaction at equilibrium is altered by

(A) changing the effective concentration of reactants.

(B) changing the effective concentration of products.

(C) changing the temperature.

(D) adding a catalyst.

(E) adding water.

151. In which gas reaction would a change in pressure have no appreciable effect upon the composition of the equilibrium mixture?

(A) $H_2 + I_2 \rightarrow 2\ HI$

(B) $2\ SO_2 + O_2 \rightarrow 2\ SO_3$

(C) $4\ HCl + O_2 \rightarrow 2\ Cl_2 + 2\ H_2O$

(D) $N_2 + 3\ H_2 \rightarrow 2\ NH_3$

(E) $2\ NO + O_2 \rightarrow 2\ NO_2$

152. Given the exothermic reaction:

$N_2(g) + 3\ H_2(g) \rightarrow 2\ NH_3(g)\ \ \Delta H = -92.1$ kJ

At 400 K, the equilibrium constant is 0.53. At 800 K, what is the value of the equilibrium constant?

(A) 0.53

(B) greater than 0.53

(C) less than 0.53

(D) dependent on the concentration of ammonia in the mixture.

153. Into an empty vessel $COCl_2(g)$ is introduced at 1.0 atm pressure whereupon it dissociates until equilibrium is established:

$2\ COCl_2(g) \rightarrow C(graphite) + CO_2(g) + 2\ Cl_2(g)$

If **x** represents the partial pressure of $CO_2(g)$ at equilibrium, what is the value of the equilibrium constant, K_p?

(A) $2x^3 / (1.0 - 2x)^2$ (C) $4x^3 / (1.0 - 2x)^2$

(B) $4x^4 / (1.0 - 2x^2)$ (C) $4x^3 / (1.0 - x)^2$

154. Calculate K_{eq} in terms of molar concentration for the reaction

$$N_2(g) + 3\ H_2(g) \rightarrow 2\ NH_3(g)$$

when the equilibrium concentration are: N_2 = 0.020 M, H_2 = 0.010 M, and NH_3 = 0.10 M.

(A) 2.0×10^{-6} (B) 5.0×10^3

(C) 5.0×10^5 (D) 5.0×10^7

155. A mixture of 2.0 mol of CO(g) and 2.0 mol of $H_2O(g)$ was allowed to come to equilibrium in a l L flask at a high temperature. If $K_c = 4.0$, what is the molar concentration of $H_2(g)$ in the equilibrium mixture?

$$CO(g) + H_2O(g) \rightarrow CO_2(g) + H_2(g)$$

(A) 1.0 (B) 0.67 (C) 0.75 (D) 1.3

156. The equilibrium constant K_p for the conversion

$$\text{butane(g)} \rightarrow \text{isobutane(g)}$$

is 2.54 at 25 °C. If butane at 1.00 atm is allowed to come to equilibrium, the partial pressure of isobutane in the equilibrium mixture will be

(A) 0.390 atm (C) 1.65 atm

(B) 0.720 atm (D) 2.54 atm

157. A 1.20-L flask contains an equilibrium mixture of 0.0168 mol of N_2, 0.2064 mol of H_2, and 0.0143 mol of NH_3. Calculate the equilibrium constant, K_c for the reaction

$$N_2(g) + 3\ H_2(g) \rightarrow 2\ NH_3(g)$$

(A) 1.38 (B) 1.99

(C) 4.12 (D) 4.96

158. At a certain temperature, the equilibrium constant for the reaction

$$2HI(g) \rightarrow H_2(g) + I_2(g)$$

is 0.49. Calculate the number of moles of hydrogen produced when one mole of HI is placed in a 1–L vessel at this temperature.

(A) 0.41 (B) 0.25

(C) 0.29 (D)3.45

159. The reaction **A** + **B** $\rightleftharpoons$ **C** + **D** has been studied at five widely different temperatures and the equilibrium constants tabulated below. At which temperature will there be the maximum conversion of **A** and **B** to **C** and **D**, when equilibrium is attained?

K at T_1	1×10^{-2}
K at T_2	2.25
K at T_3	1.0
K at T_4	81
K at T_5	0.40

(A) T_1 (B) T_2 (C) T_3

(D) T_4 (E) T_5

Answers:

97. A
98. A
99. D
100. C
101. C
102. C
103. D
104. B
105. C
106. C
107. C
108. B
109. B
110. B
111. D
112. B
113. C
114. A
115. B
116. B
117. D
118. B
119. D
120. D
121. B
122. B
123. A
124. B
125. E
126. D
127. D
128. A
129. C
130. A
131. A
132. D
133. D
134. C
135. B
136. B
137. D
138. A
139. C
140. C
141. A
142. C
143. C
144. B
145. A
146. C
147. A
148. D
149. D
150. C
151. A
152. C
153. C
154. C
155. D
156. B
157. B
158. C
159. D

Please notify Dr Mattson (brucemattson@creighton.edu) of any mistakes or problems with this review.