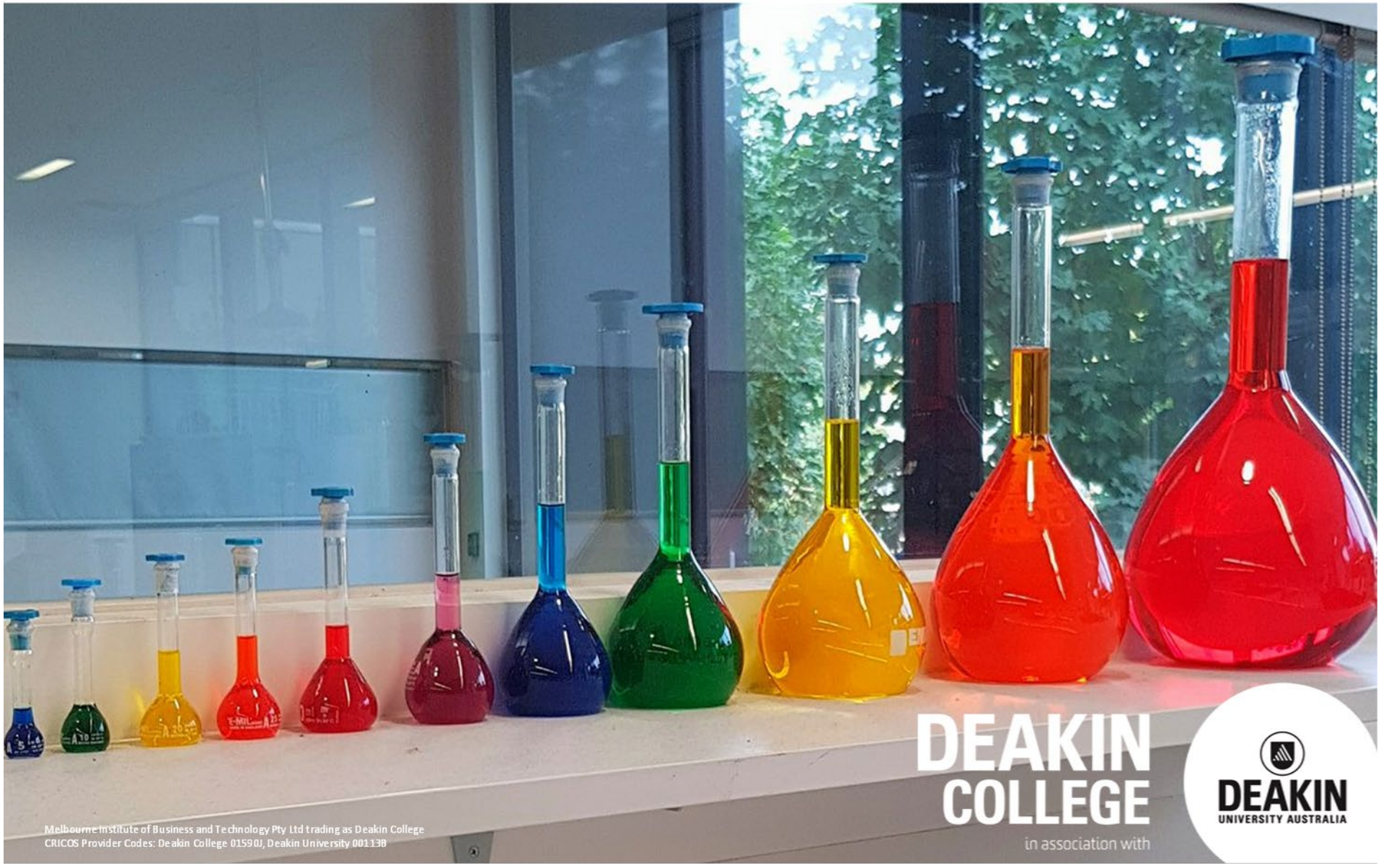
SLE155 Chemistry for the Professional Sciences

Burwood and Geelong



Practice Questions week 3

Equilibrium

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Q1

In a chemical reaction system which has reached equilibrium the net concentration of each species is unchanging even though particular molecules continue to react throughout the system.

a. True

b. False

Q2

When *Kc* is much less than 1, the reaction mixture contains a large amount of reactant and very little product.

a. True

b. False

Q3

In a heterogeneous reaction all of the reactants and products are in the same phase.

a. True

b. False

Q4

At equilibrium $Qc=Kc$.

a. True

b. False

Q5

If the reaction quotient (*Qc*) is greater than the equilibrium constant (*Kc*) then the system reacts to use up the reactants and forms more products.

a. True

b. False

Q6

Adding an inert gas to a gaseous reaction mixture at equilibrium increases the total pressure of the system and changes the position of equilibrium.

a. True

b. False

Q7

The addition of a pure solid or pure liquid has no effect on the position of equilibrium.

a. True

b. False

Q8

For an exothermic reaction, increasing the temperature decreases the equilibrium constant, so reactants are favoured.

a. True

b. False

Q9

Adding a catalyst to a reaction mixture increases the equilibrium constant, so products are favoured.

a. True

b. False

Q10

When the coefficients in an equation are multiplied by a factor, the equilibrium constant is also multiplied by the same factor.

a. True

b. False

Q11

- 4.00 moles of NH_3 were placed in a 50.0×10^{-3} m^3 container and allowed to come to equilibrium according to the equation:

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

Which situation below is true, at equilibrium?

a. [NH3] = 3 × [H2]
b. [NH3] = [H2]
c. [H2] > [NH3]
d. [NH3] > [H2]

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Q12

The following system was allowed to come to equilibrium at 300 K in a 3 L container.

$H_2(g) + X_2(g) \rightleftharpoons 2HX(g)$ $K_c = 24.4$

The system was initially charged with 1.00 mole of H_2 and 1.00 mole of I_2. How many moles of $H_2(g)$ should there be at equilibrium?

a. 0.288 mol

b. 0.147 mol

c. 0.338 mol

d. 0.256 mol

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Q 13

The following system was allowed to come to equilibrium at 318 K in a 2 L container.

$I_2(g) + Br_2(g) \rightleftharpoons 2IBr(g)$ Kc = 250

The system was initially charged with 0.0500 moles of I_2 and 0.0500 moles of Br_2. How many moles of IBr(*g*) should there be at equilibrium?

a. 0.0056 mol

b. 0.0444 mol

c. 0.0888 mol

d. 0.100 mol

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