Acid Unit: Equilibrium & Rates of Reaction

1. A sample of $NO_2(g)$ is formed from its elements . Using the **smallest whole number coefficients** to balance the reaction, the correct expression for $K_{(eq)}$ is _____

a	$\frac{[NO_2]^2}{[N_2]x[O_2]^2}$
b	$\frac{[N_2]x[O_2]^2}{[NO_2]^2}$
c	$\frac{[NO_2]^2}{[N_2]^2 x[O_2]}$
d	$\frac{[NO\ ]x[O_2]^2 x[N_2]^2}{3}$

2. The K_{eq} for a reaction is given as $K_{eq} = \frac{[R]^2[T]}{[X]^3}$

This equilibrium constant is for the reaction _____

a	2R(g) + T(aq) ← → 3X(g)
b	3X(aq) ← → 2T(aq) + R(g)
c	2Q(aq) + 3X(g) ← → T(g) + 2R(aq)
d	2Q(s) + 3X(aq) ← → T(g) + 2R(g)

3. Consider the reaction below:

$2NO_2(g)$ ← → $N_2O_4(g)$ + 55.3 kJ

The correct equation for solving for the K_{eq} of this reaction is _____

a	$K_{eq} = \frac{[N_2O_4]x55.3}{[NO_2]^2}$
b	$K_{eq} = \frac{[N_2O_4]}{[NO_2]^2}$
c	$K_{eq} = \frac{[NO_2]^2}{[N_2O_4]}$
d	$K_{eq} = \frac{[NO_2]^2}{[N_2O_4]x55.3}$

4. A characteristic of an equilibrium system is _____

a	the presence of equal amounts of reactants and products
b	the completion of a chemical reaction when changes cease to occur
c	equal amounts of reactants and products entering and being removed from the system
d	the conversion of reactants to products occurring at the same rate as the conversion of products to reactants

5. Numerical response question

Left justify your answer in the boxes provided.

Kailyn is going off to university in Los Angeles. To help her prepare, her classmates give her a Bottle-of-smog: a 100 mL glass tube that contains dinitrogen tetraoxide at equlibirum.

$N_2O_4(g) \leftarrow \rightarrow 2NO_2(g)$

The tube is placed in boiling water where it turns a dark brown. At this temperature the K_c is 0.211.
If the equilibrium concentration of $N_2O_4(g)$ is 0.049 mol/L, then the equilibrium concentration of $NO_{2(g)}$ will be a.b x 10^{-c} mol/L

Solutions:

1. A
2. D
3. B
4. D
5. 321