**Name: Period: Seat#:**

**Worksheet #6**

**Directions:** Show all work in a way that would earn you credit on the AP Test! This is always the rule! Some answers are provided at the end in italics and underlined. If you need more space, use binder paper and staple to your worksheet.

**1999 NChO Exam**

1. What is the equilibrium expression for this reaction?

P4(s) + 5 O2(g) ↔ P4O10(s)

1. Kc = [P4O10] / [P4] [O2]5
2. Kc = [P4O10] / 5 [P4] [O2]
3. Kc = [O2]5
4. Kc = 1 / [O2]5
5. For this reaction at equilibrium, which changes will increase the quantity of Fe(s)?

Fe3O4(s) + 4 H2(g) ↔ 3 Fe(s) + 4 H2O(g)

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* 1. increasing temperature
  2. decreasing temperature
  3. adding Fe3O4(s)
     1. 1 only
     2. 1 and 2 only
     3. 2 and 3 only
     4. 1,2, and 3

**1998 NChO Exam**

1. Which reaction characteristics are changing by the addition of a catalyst to a reaction to a reaction at constant temperature?
2. activation energy
3. equilibrium concentrations
4. reaction enthalpy
   1. 1 only
   2. 3 only
   3. 1 and 2 only
   4. 1, 2, and 3
5. Which reaction characteristics will be affected by a change in temperature?
6. value of equilibrium constant
7. equilibrium concentrations
   1. 1 only
   2. 2 only
   3. 1 and 2 only
   4. neither 1 nor 2

**1997 NChO Exam**

1. What is the relationship between the equilibrium constant (Kc) of a reaction and the rate constants for the foward (kf) and backward (kb) steps?
2. Kc = kf kb
3. Kc = kb / kf
4. Kc = kf / kb
5. Kc = 1 / (kfkb)
6. Xenon tetrafluoride, XeF4, can be prepared by heating Xe and F2 together according to this equation. What is the equilibrium expression for this reaction?

Xe(g) + 2F2(g) ↔ XeF4(g)

1. K = [XeF4] / ( [Xe] [F2] )
2. K = [XeF4] / ( 2[Xe] [F2] )
3. K = [XeF4] / ( [Xe] [F2]2 )
4. K = ( [Xe] [F2] ) / [XeF4]

**1996 NChO Exam**

1. What is the equilibrium expression for the decomposition of ammonium carbamate, NH4CO2NH2, that occurs according to this equation:

NH4CO2NH2(s) ↔ 2 NH3(g) + CO2(g)

1. K = [NH3][CO2]
2. K = [NH3]2[CO2]
3. K = [NH3][CO2] / [NH4CO2NH2]
4. K = [NH3]2[CO2] / [NH4CO2NH2]
5. Which factors will affect both the position of equilibrium and the value of the equilibrium constant for this reaction? The H = - 92 kJ

N2(g) + 3 H2(g) ↔ 2 NH3(g)

* 1. increasing the volume of the container
  2. adding N2
  3. removing NH3
  4. lowering the temperature

