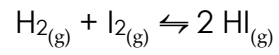
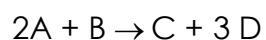


2. The following reaction is allowed to come to equilibrium at 400.0 K in a 5.00 L container



The equilibrium constant, K_p , for this reaction is 33.8 at the given temperature. If the reaction is started with $[\text{H}_2] = 0.25 \text{ M}$, $[\text{I}_2] = 0.50 \text{ M}$ and $[\text{HI}] = 2.50 \text{ M}$, what are the **equilibrium partial pressures** of all substances?

3. The following kinetic data were taken for the reaction



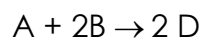
At 25.0°C			
Exp.	[A] ₀ (M)	[B] ₀ (M)	Rate ₀ (M s ⁻¹)
1	0.1500	0.0368	2.568×10 ⁻⁴
2	0.3000	0.0368	2.054×10 ⁻³
3	0.1500	0.0736	5.136×10 ⁻⁴
At 37.0°C			
4	0.1500	0.0368	6.089×10 ⁻⁴

a. Determine the **rate law** for this reaction. Include in your rate law the rate constant at 25.0°C with units.

b. What is the **activation energy** of this reaction in **kJ mol⁻¹**?

c. What is the **overall order** of the reaction?

4. Determine the **rate law** for the reaction



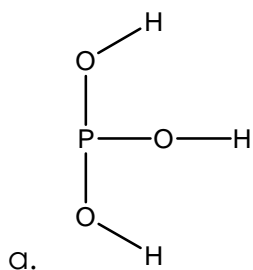
with the following mechanism.



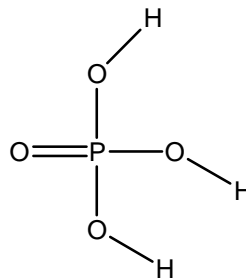
Are there any **intermediates**? _____ If so, list them _____

Are there any **catalysts**? _____ If so, list them _____

5. Determine which acid is **weaker**. Circle your answer.



or

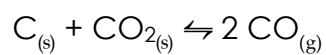


b. HBr

or

H₂Se

7. At 850°C and 1.000 atm pressure, a gaseous mixture of carbon monoxide and carbon dioxide in equilibrium with solid carbon is 90.55% CO by mass.



Calculate K_c for this reaction at 850°C.