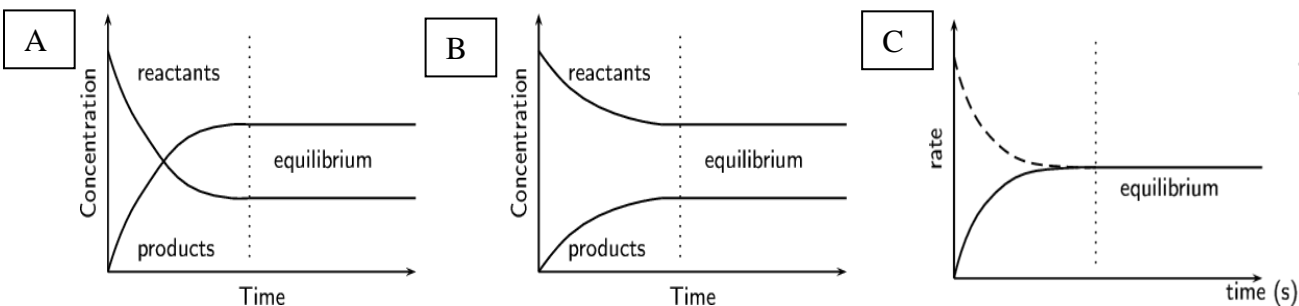


## Honors Chemistry- Equilibrium Podcasts 1-3

1. Sulfur dioxide gas and oxygen gas are placed into a sealed flask where they react to produce gaseous sulfur trioxide. When equilibrium is achieved, the gaseous product is being produced at a rate of 0.0082 mol/s. Write and balance the reaction and answer the following:

- How many moles of the product are consumed each second?
- How many moles of the oxygen gas are produced each second?
- How many grams of the oxygen gas are consumed each second?

2. Write a sentence for each of the three graphs below (A-C), which represent chemical systems in dynamic equilibrium. In your response, be sure to compare and contrast the reactants and products. Label any points of interest on each graph (e.g., intersections, curves, slope = 0, etc.).



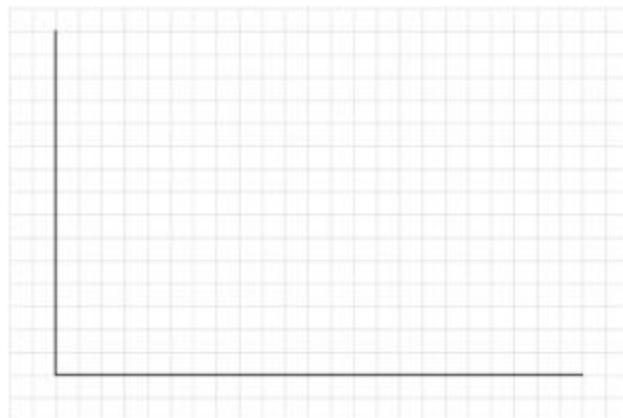
3. Hydrogen gas is mixed with gaseous iodine to yield hydrogen iodide gas. The enthalpy of reaction is +52 kJ/mol. Write and balance the thermochemical reaction:

a). Sketch a graph for this reaction showing the potential energy (kJ) as a function of time (s). On your graph label the activation energy ( $E_a$ ) and the enthalpy of reaction ( $\Delta H_{\text{rxn}}$ ).

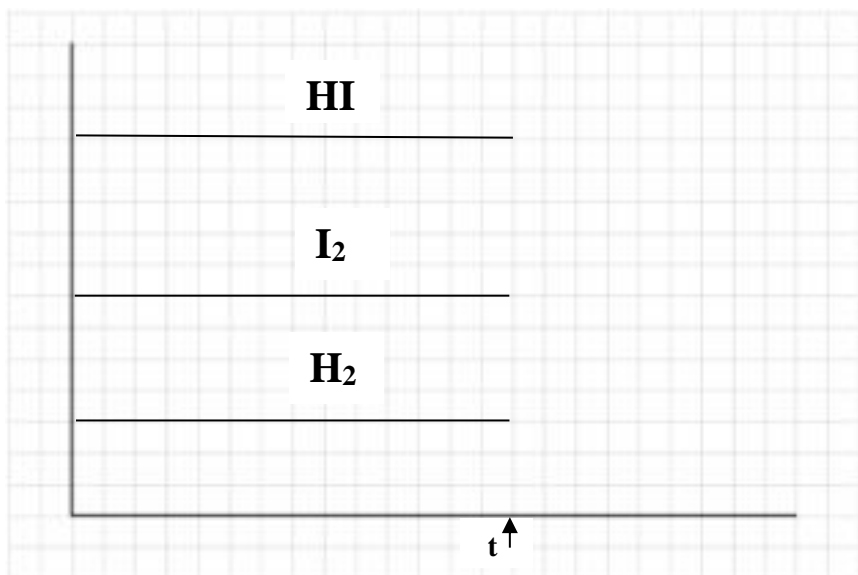
b). What would happen to the reaction if more hydrogen gas was added?

c). What would happen to the reaction if heat were removed?

d). What happens to the reaction when the volume of the reaction vessel is decreased?



e). Examine the graph of the pressure as a function of time for the chemical system in equilibrium. At some time,  $t$ , extra  $I_2$  is added to the reaction. Sketch a continuation on the graph indicating how all three substances would respond to the perturbation.



f). Write an equilibrium expression ( $K_{eq}$ ) for this reaction in question 3.