



For the exothermic reaction represented above, carried out at 298 K, the rate law is as follows.

$$\text{Rate} = k[\text{H}_2][\text{I}_2]$$

Predict the effect of each of the following changes on the initial rate of the reaction and justify your prediction.

(a) Addition of hydrogen gas at constant temperature and volume.

Reaction rate will increase w/ the addition of H_2 because the # of collisions between reactant particles will increase

(b) Increase in volume of the reaction vessel at constant temperature.

Rxn rate decreases w/ an increase in volume b/c reactants will occupy a greater space & collide less frequently.

(c) Addition of catalyst. In your explanation, include a diagram of potential energy versus reaction coordinate.

Rxn rate will increase w/ the addition of a catalyst b/c activation energy decreases.



(d) Increase in temperature. In your explanation, include a diagram showing the number of molecules as a function of energy.

Rxn rate will increase w/ an increase in temperature b/c the # of particles w/ sufficient E to react increases.

