

Le Chatelier's principle

Introduction: Le Chatelier's principle states that when a system at equilibrium undergoes stress processes will occur to reduce the stress and return the system to equilibrium.

EQUILIBRIUM AND LE CHÂTELIER'S PRINCIPLE

Reversible chemical reactions reach equilibrium in closed systems (no substances added or lost). Here's how different conditions affect that equilibrium.

EQUILIBRIUM	CONCENTRATION	TEMPERATURE	PRESSURE
A + B ⇌ C + D In reversible reactions products of the reaction can react to produce the original reactants. At dynamic equilibrium the rates of the forwards and backwards reactions are equal; the concentrations of the reactants and products don't change. 7 recovery sites at the same risk as a replant it. The size of the hole and pile of dirt stay the same.	REACTANT CONCENTRATION INCREASED The equilibrium position shifts to reduce the reactant concentration. REACTION FORMING PRODUCTS FAVOURED In the example below the new equilibrium mixture will contain a higher concentration of C and D. A + 2B ⇌ C + D INCREASE REACTANT CONCENTRATION DECREASE REACTANT CONCENTRATION Increasing concentration of one side favours the other.	TEMPERATURE INCREASED The equilibrium position shifts to reduce the temperature. THE ENDOTHERMIC REACTION WILL BE FAVOURED In the example below the new equilibrium mixture will contain more A and B, and less C and D. A + 2B ⇌ C + D EXOTHERMIC (greatest temperature) INCREASES TEMPERATURE Decreases temperature If the forward reaction is endothermic, it's favoured when it's cooler, and vice versa.	PRESSURE INCREASED The equilibrium position shifts to reduce the pressure. SIDE OF REACTION WITH FEWER GAS MOLECULES FAVOURED In the example below the new equilibrium mixture will contain more C and D, and less A and B. A + 2B ⇌ C + D DECREASE PRESSURE (fewer gas molecules on right) INCREASE PRESSURE (more gas molecules on left) If the number of gas molecules is the same on either side, then changing pressure will have no effect.
LE CHÂTELIER'S PRINCIPLE An energy for changing equilibrium conditions. Le Chatelier's principle states that when a change is made to the conditions of a dynamic equilibrium, the system moves to counteract the change, causing changes in quantities of reactants and products.	PRODUCT CONCENTRATION INCREASED The equilibrium position shifts to reduce the product concentration. REACTION FORMING REACTANTS FAVOURED In the example above the new equilibrium mixture will contain a higher concentration of A and B.	TEMPERATURE DECREASED The equilibrium position shifts to increase the temperature. THE EXOTHERMIC REACTION WILL BE FAVOURED In the example above the new equilibrium mixture will contain more C and D, and less A and B.	PRESSURE DECREASED The equilibrium position shifts to increase the pressure. SIDE OF REACTION WITH MORE GAS MOLECULES FAVOURED In the example above the new equilibrium mixture will contain more A and B, and less C and D.

Note: using a catalyst increases the rate of both the forwards and backwards reactions but doesn't change the equilibrium position.

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<https://quizlet.com/21284831/46-le-chateliers-principle-flash-cards/>