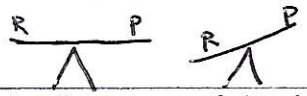
Hit me with your best LeChât! Shift it away!

Students will be able to: Use Le Châtelier's Principle to evaluate shifts in equilibrium

Le Châtelier's Principle states: ↳ an equilibrium rxn, when stressed, will shift to reestablish equilibrium



Changing the amount of chemicals present	Changing temperature → value K of changes
- add something, rxn will shift away from that side to use up some of the extra stuff added - remove something, rxn will shift toward that side to make more of what was removed	Don't memorize. Use logic! ΔH<0, exothermic rxn (heat = Product) ΔH>0, endothermic rxn (heat = reactant)

* adding/removing a solid or liquid does not cause a shift

22. For each of the following scenarios, state which way the equilibrium would shift in response to the change:

A(g) + 2B(l) <---> C(g)

a. The reaction is endothermic and the temperature is increased. heat + A + B ⇌ C Right
b. More A is added to the container. Right
c. Some B is removed from the container. no shift (it's a liquid)
d. The reaction is exothermic and the temperature is increased. A + B ⇌ C + heat Left
e. More C is added to the container. Left
f. Some A is removed from the container. Left
g. The reaction is endothermic and the temperature is decreased. Left

23. For each of the following scenarios, state which way the equilibrium would shift in response to the change:

A(l) <---> B(g) + C(g) + heat ΔH<0 = exothermic

a. Temperature is increased. Left
b. More C is added to the container. Left
c. Some B is removed from the container. Right
d. Temperature is decreased. Right
e. More A is added to the container. no shift (it's a liquid)

24. For each of the following scenarios, state which way the equilibrium would shift in response to the change:

heat + 2A(g) + B(g) <---> 2C(g) ΔH>0 endothermic

a. Some B is removed from the container. Left
b. Temperature is increased. Right
c. More C is added to the container. Left
d. Temperature is decreased. Left
e. More A is added to the container. Right

25. Under what circumstances would changing the temperature cause a shift toward the reactants?

If it is ENDO and Temp ↓ OR If it is EXO and Temp ↑

26. What are some steps a manufacturer could take to cause a shift toward products and increase their profit?

- add more reactants
- remove products
- ↑ or ↓ temp depending on exo or endo