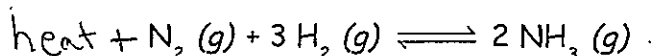


If a system at equilibrium is subjected to a _____, the equilibrium is displaced in the direction that relieves the _____.

- A stress is defined as any change which could affect the _____ of either or both the forward and/or reverse reaction.
- When, because of an applied stress, the forward reaction is faster than the reverse reaction, the system is said to shift to the (right, left). As a result, the [products] will (increase, decrease) and the [reactants] will (increase, decrease).
- When, because of an applied stress, the reverse reaction is faster than the forward reaction, the system is said to shift to the (right, left). As a result, the [products] will (increase, decrease) and the [reactants] will (increase, decrease).

In simpler terms: If anything is added to a system at _____, the system will try to consume whatever was _____. If anything is removed from a system at equilibrium, the system will try to replace whatever was _____. So, the reaction is favored away from what is (added, removed) and toward what is (added, removed).

1. In the following reaction, will the [H₂] increase or decrease when equilibrium is reestablished after these stresses are applied?



NH₃(g) is added _____ N₂(g) is removed _____
 temperature is increased _____

2. Note reaction: $2 \text{NO}(\text{g}) + \text{H}_2(\text{g}) \rightleftharpoons \text{N}_2\text{O}(\text{g}) + \text{H}_2\text{O}(\text{g}) + \text{heat}$

In which direction, left or right, will the equilibrium shift if the following changes are made?

NO is added _____ the system is cooled _____
 H₂ is removed _____
 N₂O is added _____ H₂ is removed _____

3. In this reaction: $CO_2 (g) + H_2 (g) + \text{heat} \rightleftharpoons CO (g) + H_2O (g)$

a. Is heat absorbed or released by the forward reaction?

b. In which direction will the equilibrium shift if these changes are made?

CO is added	_____	temperature is increased	_____
CO ₂ is added	_____	system is cooled	_____
H ₂ is removed	_____		

4. In this reaction: $2 NO (g) + H_2 (g) \rightleftharpoons N_2O (g) + H_2O (g) + \text{heat}$

What will happen to the [H₂O] when equilibrium is reestablished after these stresses are applied?

temperature is increased	_____
a catalyst is added	_____
NO is added	_____
N ₂ O is removed	_____

Colligative Properties Questions

Why does salt water boil at a higher temperature compared to pure water?

Why does salt water freeze at a lower temperature than pure water?

Acids and Bases questions

Listed below are some of the properties of acids and bases. Fill in the blanks with the appropriate word, acids or bases:

- a) _____ produce hydrogen ions (H⁺) in solution
- b) _____ have a sour taste
- c) _____ have a bitter taste
- d) _____ have a slippery, soapy feel
- e) _____ produce hydroxide ions (OH⁻) ions