

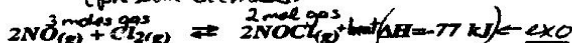
**KEY**



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- d) H<sub>2</sub> gas is removed from the system..... Answer P<sub>CH<sub>3</sub>OH</sub> decreases (shifts left)  
 e) A catalyst is added..... Answer no change  
 f) The total volume of the container is increased..... Answer P<sub>CH<sub>3</sub>OH</sub> decreases (shift left)

10. For the reaction:

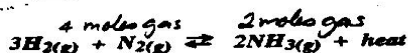


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state the optimal pressure and temperature conditions necessary for maximum production of NOCl. (you want it to shift right and produce more NOCl)

1. high pressure      2. low temperature

11. For the reaction:

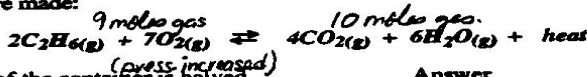


2

state the optimal conditions for a high yield of ammonia (NH<sub>3</sub>).

1. high pressure      2. low temperature

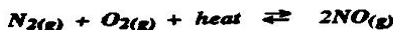
12. Given the following equilibrium system, state which way the equilibrium will shift when the changes below are made:



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- a) The volume of the container is halved..... Answer left  
 b) The temperature is decreased..... Answer right  
 c) CO<sub>2</sub> is added to the container..... Answer left  
 d) The total pressure is increased..... Answer left  
 e) O<sub>2</sub> gas is removed from the system..... Answer left  
 f) Neon gas is added to increase the total pressure..... Answer no shift  
 h) A catalyst is added..... Answer no shift

13. Using the equilibrium:



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Explain why nitric oxide (NO) does not generally form in the atmosphere but is formed in the internal combustion engine of an automobile or during a lightning storm.

Tendency toward min. enthalpy favours reactants. No change in entropy.

At high temp (in engine or near lightning) addition of heat causes a shift to the right and some NO is formed.

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