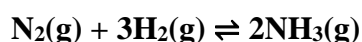


Name \_\_\_\_\_ Date \_\_\_\_\_

## Worksheet 18.1: Equilibrium and Le Chatelier's principle

To produce ammonia, hydrogen and nitrogen are reacted together, according to the following equation, with the forward reaction being exothermic:



The conditions used for the industrial production of ammonia are as follows:

- 200 atmospheres of pressure
- 450 °C
- iron catalyst.

- 1 Using your knowledge of the equilibrium topic and Le Chatelier's principle, please state what the optimum conditions would be to produce the highest yield of ammonia and explain why.

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- 2 Why do they use a high temperature in industry to produce ammonia?

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- 3 How does the catalyst affect the position of equilibrium?

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- 4 Why is a catalyst used for this reaction?

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