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:

**N2(g) + 3H2(g) ⇌ 2NH3(g)**

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.

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

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

**4** Why is a catalyst used for this reaction?