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|  | Making ammonia – the Haber process |
|  | Why do we need plants? |  |
| Why do we need to assist plants in getting nitrogen when the air contains 80% nitrogen? |  |
| How do most plants absorb nitrogen? |  |
| Why does the nitrogen in plants not find its way back to the soil? |  |
| What do we generally use to replenish the nitrogen in the soil? |  |
| The Haber process | What is the Haber process? |  |
| What raw materials are needed for making ammonia? |  |
| What conditions are required for the Haber process? |  |
| How is the ammonia gas separated from the reactants in this reversible reaction? |  |
| What happens to the unreacted nitrogen and hydrogen? |  |
| What is a huge commercial benefit of removing the ammonia as it is produced? |  |
| What are the benefits and costs of the special conditions needed for the Haber process? | **Benefits**: **Costs**: *a* |
|  | The economics of the Haber process (HIGHER) |
| The effect of pressure | Which direction of reaction is favoured by increasing the pressure during the Haber process? |  |
| Why does the Haber process use 200 atmospheres pressure when a higher pressure would produce more products? |  |
| The effect of temperature | What **two** factors of the reaction are affected by temperature? How are they affected? | 1.  |
| 2.  |
| Give **two** reasons why 450°C is used when a lower temperature would produce a higher yield? | 1.  |
| 2.  |
| The effect of a catalyst? | What effect does the catalyst have on yield? Why? |  |
| Why is a catalyst used? |  |