Homework sheet

Name Class Date

**1** Use the words from the word bank to complete the gaps below. Use each word only once.

[15 marks]

Word bank

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| ammonia | anhydrous | blue | change | colourless | cool | gas | gases |
| heat | heated | reversible | solid | test | water | white |  |

If hydrated copper(II) sulfate is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ it changes from a bright \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ colour to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. It is still copper(II) sulfate, but it now contains no \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. The chemical term for a substance that contains no water is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

If water is added to the white copper(II) sulfate it will \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ back to its original colour. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ energy will also be given out. This shows us that a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ reaction has taken place. This can be used as a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ for water.

If ammonium chloride crystals are heated, they separate into \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ gas and hydrogen chloride \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ which are both \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. As these gases \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ they change back into ammonium chloride which forms white \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. The reaction is reversed as the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ cool down.

[Total for Question 1  15 marks]

**2** If calcium carbonate is heated in a sealed test tube it reaches a dynamic equilibrium with calcium oxide and carbon dioxide.

CaCO3(s)  CaO(s)  CO2(g)

**a** This reaction is taking place in a closed system. Explain what this statement means.

[1 mark]

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**b** Write an equation for the forward reaction.

[1 mark]

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**c** State which type of reaction is the forward reaction, exothermic or endothermic.

[1 mark]

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**d** Write an equation for the backward reaction.

[1 mark]

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**e** State which type of reaction is the backward reaction, exothermic or endothermic.

[1 mark]

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**f** Explain what is meant by the term ‘dynamic equilibrium’.

[1 mark]

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**g** Explain the effect of increasing the temperature on this reaction to the position of equilibrium.

[3 marks]

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[Total for Question 2  9 marks]

**3** For each of the following conditions suggest the change in equilibrium position each will have and explain why.

**a** Increasing the temperature when the backward reaction is endothermic.

[2 marks]

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**b** Decreasing the pressure when there are more gas particles in the backward reaction.

[2 marks]

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**c** Adding a catalyst when the forward reaction is endothermic.

[2 marks]

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**d** Decreasing the temperature when the forward reaction is endothermic.

[2 marks]

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**e** Increasing the pressure when there are more gas particles in the backward reaction.

[2 marks]

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**f** Adding a catalyst when the forward reaction has more gas particles than the backward reaction.

[2 marks]

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[Total for Question 3  12 marks]

[Total for Homework  36 marks]