Homework sheet

Name Class Date

**1** The word equation for the Haber process is shown below.

hydrogen  nitrogen  ammonia

**a** What does this sign ‘’ tell us about the reaction?

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**b** What does the term dynamic refer to in **dynamic equilibrium**?

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**2** If calcium carbonate is heated in a sealed test tube, an equilibrium is established.

CaCO3(s)  CaO(s)  CO2(g)

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

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

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**c** Explain why an equilibrium cannot be established in an ‘**open system**’.

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**3** Use the words in the box to complete the gaps below. Use each word only once.

Word bank

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| ammonia | anhydrous | change | colourless | cool | crystals |
| gases | heat | heated | reversible | water | white |

If hydrated copper(II) sulfate is \_\_\_\_\_\_\_\_\_\_\_\_\_ it changes from a bright blue 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 copper(II) sulfate it will \_\_\_\_\_\_\_\_\_\_\_\_\_\_ back to its original colour. \_\_\_\_\_\_\_\_\_\_\_\_ will also be given out. This shows us that a \_\_\_\_\_\_\_\_\_\_\_\_\_\_ reaction has taken place. If ammonium chloride crystals are heated they separate in to \_\_\_\_\_\_\_\_\_\_\_gas and hydrogen chloride gas, which are both \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. As these gases \_\_\_\_\_\_\_\_\_\_\_ they change back into ammonium chloride, which forms white \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. The reaction is reversed as the \_\_\_\_\_\_\_\_\_\_\_\_\_\_ cool down.