Answer sheet

Contents

IG Teaching Hubs Chemistry Worksheets [2](#IGTeachingHubsChemistryWorksheets)

Lesson 89 – Worksheet 1 [2](#Lesson89Worksheet1)

Lesson 89 – Worksheet 2 [2](#Lesson89Worksheet2)

Lesson 89 – Worksheet 3 [2](#Lesson89Worksheet3)

Lesson 89 – Worksheet 4 [3](#Lesson89Worksheet4)

IG Teaching Hubs Chemistry Homework sheets [4](#IGTeachingHubsChemistryHomeworksheets)

Lesson 89 – Homework [4](#Lesson89Homework)

IG Teaching Hubs Chemistry Worksheets

Lesson 89 – Worksheet 1

**1 a** The reaction shows the symbol / double headed arrow; which means that the reaction can go in both directions.

**b** (white) solid changes/decomposes to colourless gases

**c** ammonium chloride, hydrogen chloride, ammonia

**d** to the left

**e** As the reactants have reduced, the position has shifted towards the right; however, overall, the position of equilibrium is still to the left.

Lesson 89 – Worksheet 2

**1** **a** The reaction shows the symbol  / double headed arrow; which means that the reaction can go in both directions.

**b** (white) solid changes/decomposes to colourless gases

**c** ammonium chloride, hydrogen chloride, ammonia

**d** to the left

**e** As the reactants have reduced, the position has shifted towards the right; however, overall, the position of equilibrium is still to the left.

Lesson 89 – Worksheet 3

**1**

|  |  |
| --- | --- |
| Reaction | Equilibrium shift |
| A(g)  B(g)  C(g) | **shift to right** |
| A(g)  B(g)  C(g) | **shift to left** |
| A(g)  B(g)  C(g) | **no change** |
| A(g)  B(g)  C(g) | **shift to left** |
| 3A(g)  B(g)  C(g) | **shift to right** |
| 3A(g)  2B(g)  C(g) | **no change** |
| 3A(g)  2B(g)  C(g) | **shift to right** |
| 3A(g)  B(g)  C(g) | **shift to left** |
| 3A(g)  B(g)  2C(g) | **no change** |
| 3A(g)  B(g)  2C(g) | **no change** |
| A(g)  B(g)  C(g) | **shift to right** |

**2** As the temperature is decreased, the equilibrium shifts to the **right** so the colour gets lighter. This changes brown NO2 molecules into colourless N2O4 molecules as this is the exothermic direction, which increases the **temperature**.

If the pressure is increased, the equilibrium position shifts **right** to form more N2O4 as this **decreases** the pressure again. When this happens, the colour gets lighter as N2O4 is **colourless**.

Lesson 89 – Worksheet 4

**1**

|  |  |
| --- | --- |
| Reaction | Equilibrium shift |
| A(g)  B(g)  C(g) | **shift to right** |
| A(g)  B(g)  C(g) | **shift to left** |
| A(g)  B(g)  C(g) | **no change** |
| A(g)  B(g)  C(g) | **shift to left** |
| 3A(g)  B(g)  C(g) | **shift to right** |
| 3A(g)  2B(g)  C(g) | **no change** |
| 3A(g)  2B(g)  C(g) | **shift to right** |
| 3A(g)  B(g)  C(g) | **shift to left** |
| 3A(g)  B(g)  2C(g) | **no change** |
| 3A(g)  B(g)  2C(g) | **no change** |
| A(g)  B(g)  C(g) | **shift to right** |

**2** As the temperature is decreased, the equilibrium shifts to the **right** so the colour gets lighter. This changes brown NO2 molecules into colourless N2O4 molecules as this is the exothermic direction, which increases the **temperature**.

If the pressure is increased, the equilibrium position shifts **right** to form more N2O4 as this **decreases** the pressure again. When this happens, the colour gets lighter as N2O4 is **colourless**.

IG Teaching Hubs Chemistry Homework sheets

Lesson 89 – Homework

**1 1 mark for each word [15 marks in all]**

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

**2 a** when substances cannot enter or leave an observed environment e.g. a stoppered test tube [**1 mark**]

**b** CaCO3(s) 🡪 CaO(s)  CO2(g) [**1 mark**]

**c** endothermic [**1 mark**]

**d** CaO(s)  CO2(g) 🡪 CaCO3(s) [**1 mark**]

**e** exothermic [**1 mark**]

**f** when the forward and backward reactions in a reversible chemical reaction are occurring at the same rate **[1 mark]**

**g** increasing the temperature shifts the position of equilibrium to the right [**1 mark**] because the forward reaction is endothermic this will reduce the temperature   
[**1 mark**]

**3** **a** position of equilibrium will shift to left [**1 mark**] to reduce the temperature of the system by favouring the endothermic/backward reaction [**1 mark**]

**b** position of equilibrium will shift to left [**1 mark**] to increase the pressure of the system by favouring the reaction which produces more particles [**1 mark**]

**c** position of equilibrium will not change [**1 mark**] catalysts do not have any effect on the position of the equilibrium [**1 mark**]

**d** position of equilibrium will shift to left [**1 mark**] to increase the temperature of the system by favouring the exothermic/backward reaction [**1 mark**]

**e** position of equilibrium will shift to right [**1 mark**] to decrease the pressure of the system by favouring the reaction which produces fewer particles [**1 mark**]

**f** position of equilibrium will not change [**1 mark**] catalysts do not have any effect on the position of equilibrium [**1 mark**]