

Answers of Pack 2- (Unit 2)

Topic 2.1 Dissolving

Exercise 2.1A Using the correct scientific term

- A mixture
- B filtrate
- C solute or accept solid
- D solvent
- E solution

Exercise 2.1B What is the difference between these terms?

- 1 If something is transparent, you can see through it. For example: clear plastic or a solution of copper sulfate is transparent and you can see what is inside or behind it. Something that is opaque does not allow light through it, for example, milk or a container made of ceramic or metal does not allow you to see what is inside.
- 2 When something dissolves, such as sugar in tea, there are two substances involved: the sugar that dissolves and the tea that it dissolves into. When something melts, only that one substance is involved: ice cream on a hot day, for example.
- 3 A solute is something that dissolves in a solvent to form a solution.

Exercise 2.1C Explaining observations

- 1 120 g
- 2 When the salt dissolves in the water, it does not disappear, but is still in the water, although you can't see it any more. You have added 20 g of salt to 100 g of water so there will be 120 g of solution.

Topic 2.2 Solutions and solubility

Exercise 2.2A Using the correct scientific term

- 1 insoluble
- 2 concentrated
- 3 saturated solution
- 4 soluble
- 5 diluted

Topic 2.3 Planning a solubility investigation

Exercise 2.3A Dissolving salt

- 1 Sofia predicted that the more water they used, the more salt would dissolve in it.
- 2 The reading taken for 20 cm³ water has been plotted incorrectly on the graph (on the 25 cm³ line). This should be circled in red.
- 3 The reading taken for 60 cm³ water, 26 g, looks too high and is the same as the reading for 70 cm³ water. This should be circled in blue on the graph and in the results table.
- 4 The line of best fit should pass through or close to all of the plotted points, after the two errors highlighted in question 2 has been corrected and that in question 3 has been ignored.
- 5 The graph shows that the larger the volume of water used, the larger the mass of salt that can be dissolved.
- 6 Yes, Sofia's prediction was correct.

Exercise 2.3C Comparing the solubility of two salts 2

- 5 80 °C
- 6 salt Y
- 7 The solubility of salt X at 0 °C is about 55 g/100 g water. The solubility rises slowly as the temperature increases to about 70 °C, then the graph levels off. This shows that any increase in temperature over 70 °C makes no difference to the quantity of salt X that can dissolve.

Exercise 2.4B Paper chromatography

- 1 So that it will be carried up as the water moves upwards and does not move into the water at the bottom of the beaker.
- 2 six
- 3 The third patch from the top should be circled.
- 4 The scientist needs to check that she gets the same result if she repeats the test. She also needs to find out what the colouring is, so that if it is harmful, the company making the drink can be advised to stop using it.

Exercise 2.4C Paper chromatography with plant material

- 1 This happened because the dried liquid was not soluble in water.
- 2 Sofia should now try using a different solvent such as ethanol.
- 3 A – glass rod or any sensible item, such as a pencil or spill to support the chromatography paper).
B – solvent front place where solvent reached.
C – beaker
D – chromatography paper

E – spot where liquid was placed at start
F – solvent
- 4 So that a small spot of liquid would be more concentrated.
- 5 It is a mixture because there are several spots of different substances.