

WATER AND SOLUTION

AIR DAN LARUTAN

- 5.1 Physical Characteristics of Water
Sifat Fizik Air
- 5.2 Solution and Rate of Solubility
Larutan dan Kadar Keterlarutan
- 5.3 Water Purification and Water Supply
Pembersihan dan Pembekalan Air

5.1 Physical Characteristics of Water

5.1 Sifat Fizik Air

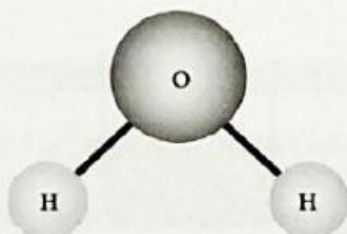
- 5.1.1 Elaborate and communicate about water
Menghuraikan dan berkomunikasi tentang air
- 5.1.2 Communicate about the water evaporation process in daily life
Berkomunikasi tentang proses penyejatan air dalam kehidupan harian

5.1.1 Water

Air

Example 1

Diagram below shows the composition of elements in one molecule of water.
Rajah di bawah menunjukkan komposisi unsur-unsur dalam satu molekul air.



- (a) State the composition of elements in the water molecule.
Nyatakan komposisi unsur dalam molekul air itu.
- (b) List three physical characteristics of water.
Senaraikan tiga sifat fizik air.

Answer/Jawapan

- (a) Two hydrogen atoms and one oxygen atom
Dua atom hidrogen dan satu atom oksigen
- (b) • Has a high surface tension
Mempunyai permukaan tegangan yang tinggi
- Has boiling point of 100 °C and freezing point of 0°C
Mempunyai takat didih 100 °C dan takat beku 0°C
- Colourless and odourless
Tidak berwarna dan tidak berbau

Practise Now 1

Describe the physical characteristics of water based on the table below.
 Huraikan sifat fizik air berdasarkan jadual di bawah.

Similar Questions

Exercise 5.1:
 [Question 2(d)]

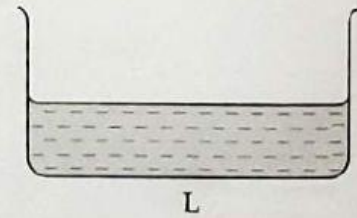
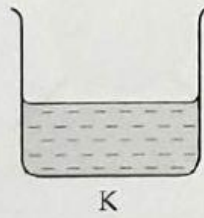
Boiling point <i>Takat didih</i>	(a)
Freezing point <i>Takat beku</i>	(b)
Colour <i>Warna</i>	(c)
Density <i>Ketumpatan</i>	(d)
Surface tension <i>Tegangan permukaan</i>	(e)
Capillary action <i>Tindakan kapilari</i>	(f)

5.1.2 Water evaporation process in daily life
Proses penyejatan air dalam kehidupan harian

Example 2

Nadim set up an experiment to study the factor affecting the rate of evaporation of water. Three containers are exposed to air for three hours.

Nadim menjalankan suatu eksperimen bagi mengkaji faktor yang mempengaruhi kadar penyejatan air. Tiga bekas dibiarkan terdedah pada udara selama tiga jam.



- Which container has the lowest amount of water after three hours?
Bekas yang manakah mempunyai jumlah air paling sedikit selepas tiga jam?
- Give inference based on your answer in (a).
Berikan inferens berdasarkan jawapan anda di (a).
- State other two factors affecting the rate of evaporation of water.
Nyatakan dua faktor lain yang mempengaruhi kadar penyejatan air.

Answer/Jawapan

- L
- L has the largest surface area of water that exposed to air
L mempunyai luas permukaan air paling besar yang terdedah pada udara
- Air movement and surrounding temperature
Pergerakan udara dan suhu persekitaran

Practise Now 2

Similar Questions
Exercise 5.1:
[Question 3]

State whether the rate of evaporation of water is high or low based on the factors given.

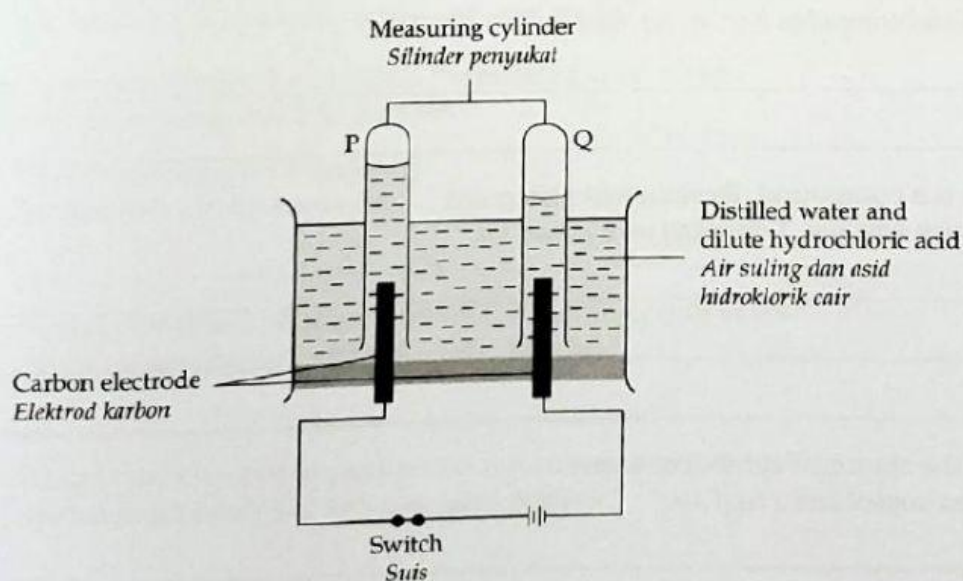
Nyatakan sama ada kadar penyejatan air adalah tinggi atau rendah berdasarkan faktor-faktor yang diberikan.

Factors Faktor-faktor		Rate of evaporation of water Kadar penyejatan air
Air humidity Kelembapan udara	High Tinggi	(a)
	Low Rendah	(b)
Surrounding temperature Suhu persekitaran	High Tinggi	(c)
	Low Rendah	(d)
Movement of air Pergerakan udara	Fast Laju	(e)
	Slow Perlahan	(f)
Exposed surface area of water Luas permukaan air yang terdedah	Large Besar	(g)
	Small Kecil	(h)

Exercise 5.1

- 1 Diagram below shows the set-up of apparatus to determine the composition of elements in a water molecule.

Rajah di bawah menunjukkan susunan radas bagi menentukan komposisi unsur dalam suatu molekul air.



- (a) Complete the table below regarding the results of the experiment.
Lengkapkan jadual di bawah mengenai keputusan eksperimen tersebut.

	P	Q
Name of gas produced <i>Nama gas yang terhasil</i>		
Type of gas test <i>Jenis ujian gas</i>		
Result of the gas test <i>Keputusan ujian gas</i>		

- (b) State the ratio of the volume of gas in measuring cylinders P to Q.
Nyatakan nisbah bagi isi padu gas dalam silinder penyukat P kepada Q.

- (c) Why is dilute hydrochloric acid added into the distilled water?
Mengapakah asid hidroklorik ditambahkan ke dalam air suling?

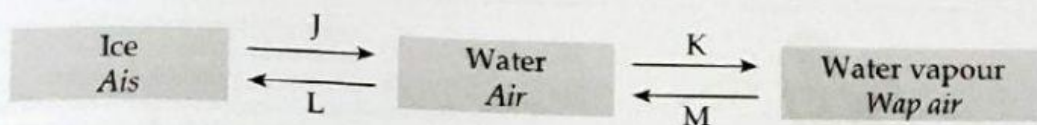
- (d) Name the process carried out in this experiment.
Namakan proses yang dijalankan dalam eksperimen ini.

- (e) State the conclusion for this experiment.
Nyatakan kesimpulan bagi eksperimen ini.

- (f) Water is a compound. Explain this statement.
Air adalah sebatian. Terangkan pernyataan ini.

- (g) Write the chemical symbol of water.
Tuliskan simbol kimia bagi air.

- 2 Study the flowchart below.
Kaji carta alir di bawah.



- (a) Name the processes represented by the arrows J, K, L and M.
Namakan proses-proses yang diwakili oleh anak panah J, K, L dan M.

J		L	
K		M	

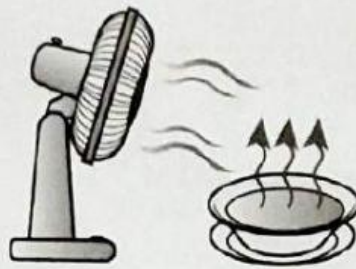
- (b) Which processes named in 2(a) involved heat gain?
Proses manakah yang dinamakan di 2(a) terlibat dengan penerimaan haba?
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- (c) Which processes named in 2(a) involved heat loss?
Proses manakah yang dinamakan di 2(a) terlibat dengan kehilangan haba?
-
- (d) Which of the following statements about water are true? Tick [✓] the correct answer.
Pernyataan yang manakah mengenai air adalah benar? Tandakan [✓] pada jawapan yang betul.

- | | |
|--|--------------------------|
| (i) The boiling point of water is 100 °C
Takat didih air adalah 100 °C | ☐ |
| (ii) The freezing point of water is 0 °C
Takat beku air adalah 0 °C | ☐ |
| (iii) Water has high surface tension
Air mempunyai tegangan permukaan yang tinggi | ☐ |
| (iv) Water has low surface tension
Air mempunyai tegangan permukaan yang rendah | ☐ |

- (e) Impurities can change the physical characteristics of water.
Bendasing boleh mengubah sifat fizik air.

- (i) Give one example of impurity.
Berikan satu contoh bendasing.
-
- (ii) What is the effect of impurities on the melting point of ice?
Apakah kesan bendasing terhadap takat beku ais?
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- (iii) What is the effect of impurities on the boiling point of water?
Apakah kesan bendasing terhadap takat didih air?
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- 3 Diagram below shows two bowls of soup are placed at different conditions.
Rajah di bawah menunjukkan dua mangkuk sup yang diletakkan pada keadaan yang berbeza.

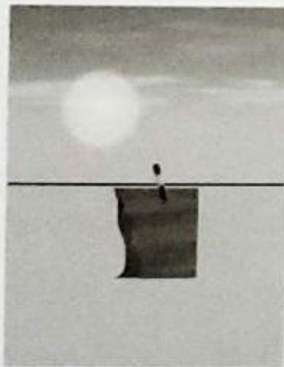


Situation A
Situasi A

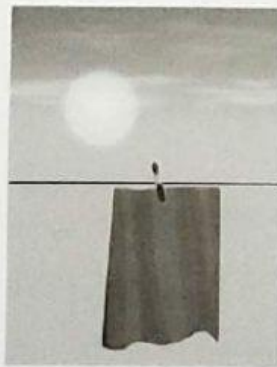


Situation B
Situasi B

- (a) Compare the rate of evaporation of water in both situations.
Bandingkan kadar penyejatan air dalam kedua-dua situasi.
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- (b) Explain your answer in 3(a).
Terangkan jawapan anda di 3(a).
-
-
- (c) Four handkerchiefs of equal sizes are hung differently on a laundry line during the day and night.
Empat sapu tangan dengan saiz yang sama digantung dengan cara berbeza di ampaian pada waktu siang dan malam.



P



Q



R



S

- (i) Arrange the handkerchiefs in the correct order from the one that dries the fastest to the slowest.
Susun sapu tangan mengikut tertib yang paling pantas mengering sehingga paling lambat.
-
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- (ii) Give a reason for your answer in 3(c)(i).
Berikan sebab bagi jawapan anda di 3(c)(i).
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