CHAPTER 4 : MATTER AND SUBSTANCES
BAB 4 : JIRIM DAN BAHAN

SECTION A
BAHAGIAN A

1 Diagram 1.1 and Diagram 1.2 shows an experiment to study the effect of impurities on the freezing point of distilled water.
Rajah 1.1 *dan Rajah* 1.2 *menunjukkan eksperimen untuk mengkaji kesan bendasing ke atas takat beku air suling.*

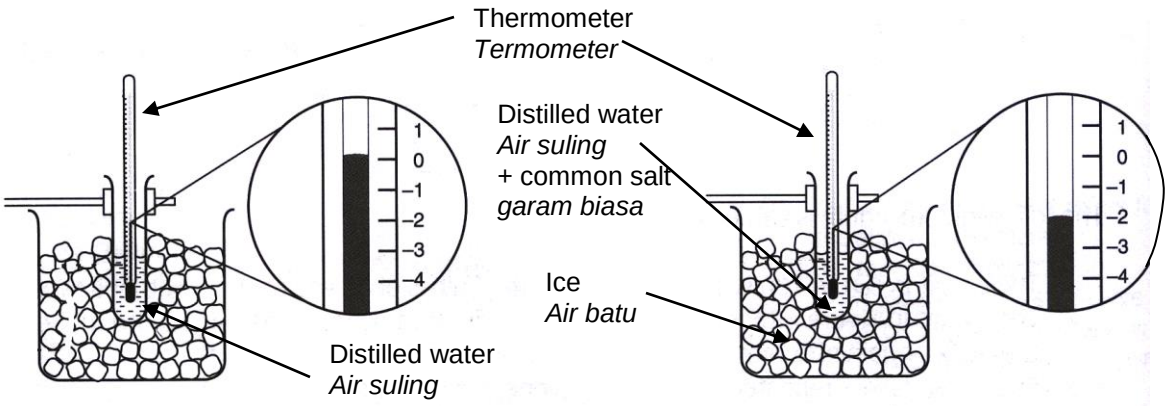


Diagram 1.1
Rajah 1.1

Diagram 1.2
Rajah 1.2

(a) (i) Based on the above experiment , what is your observation of the thermometer reading ?
Berdasarkan eksperimen di atas, apakah pemerhatian anda pada bacaan termometer?

……
[1 mark / 1 *markah*]

(ii) What is the thermometer reading in Diagram 1.2 ?
Apakah bacaan termometer pada Rajah 1.2?

.....^{0} C

[1 mark / 1 *markah*]

(b) State the variables in this experiment.
Nyatakan pemboleh ubah dalam eksperimen ini

(i) Manipulated variable
Pemboleh ubah yang dimanipulasikan

.....
[1 mark / 1 *markah*]

(ii) Responding variable
Pemboleh ubah yang bergerakbalas

.....

[1 mark / 1 *markah*]

(c) State one inference for this experiment.
Nyatakan satu inferens dalam eksperimen ini

.....

[1 mark / 1 *markah*]

2 Diagram 2 shows an experiment to study the effect of impurities on boiling point of distilled water.
Rajah 2 menunjukkan eksperimen untuk mengkaji kesan bendasing ke atas takat didih air suling.

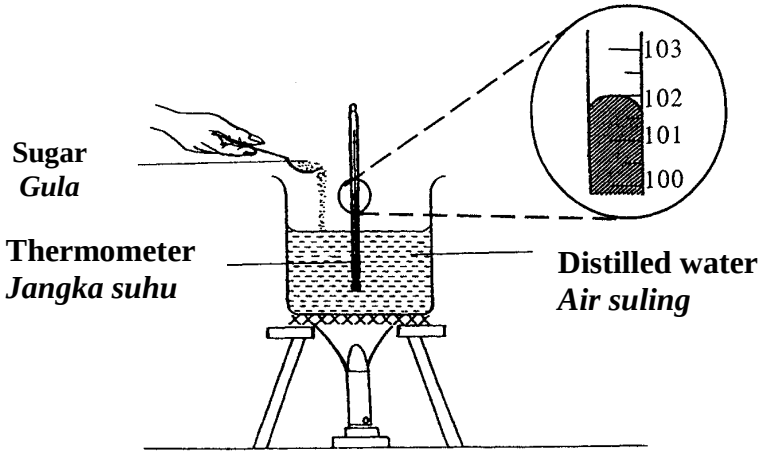


Diagram 2
Rajah 2

The results obtained are recorded in Table 2
Keputusan yang diperolehi dicatatkan dalam Jadual 2

Type of Substance ***Jenis Bahan***	**Boiling point/ °C** ***Takat didih/ °C***
Distilled water *Air suling*	100
Distilled water + sugar *Air suling + gula*	

Table 2
Jadual 2

(a) Based on the above experiment, complete Table 2
Berdasarkan eksperimen di atas, lengkapkan Jadual 2

[1 mark / 1 *markah*]

(b) State the variables for this experiment:
Nyatakan pembolehubah bagi eksperimen ini
i) Responding variable:
Pembolehuah bergerak balas:

.....

ii) Constant variable:
Pembolehuah dimalarkan:

.....

[2 marks / 2 *markah*]

(c) State the hypothesis based on this experiment.
Nyatakan hipotesis berdasarkan eksperimen ini.

.....

[1 mark / 1 *markah*]

(d) What is the operational definition for distilled water?
Apakah definisi secara operasi bagi air suling?

.....

[1 mark / 1 *markah*]

4.6 Metal and non metal
4.6 Logam dan bukan logam

Diagram 3.1 and Diagram 3.2 show the set-up of an experiment to study the malleability of different materials by hitting it with a hammer.

Rajah 3.1 dan Rajah 3.2 menunjukkan susunan radas bagi satu eksperimen untuk mengkaji ketertempaan bahan yang berbeza dengan mengetuk bahan tersebut menggunakan penukul.

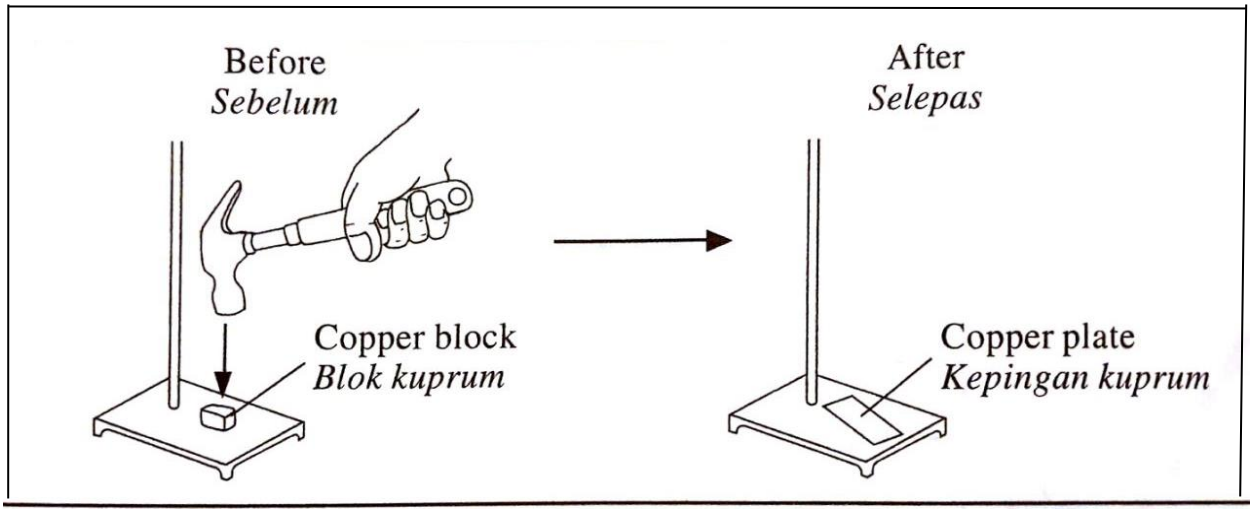


Diagram 3.1
Rajah 3.1

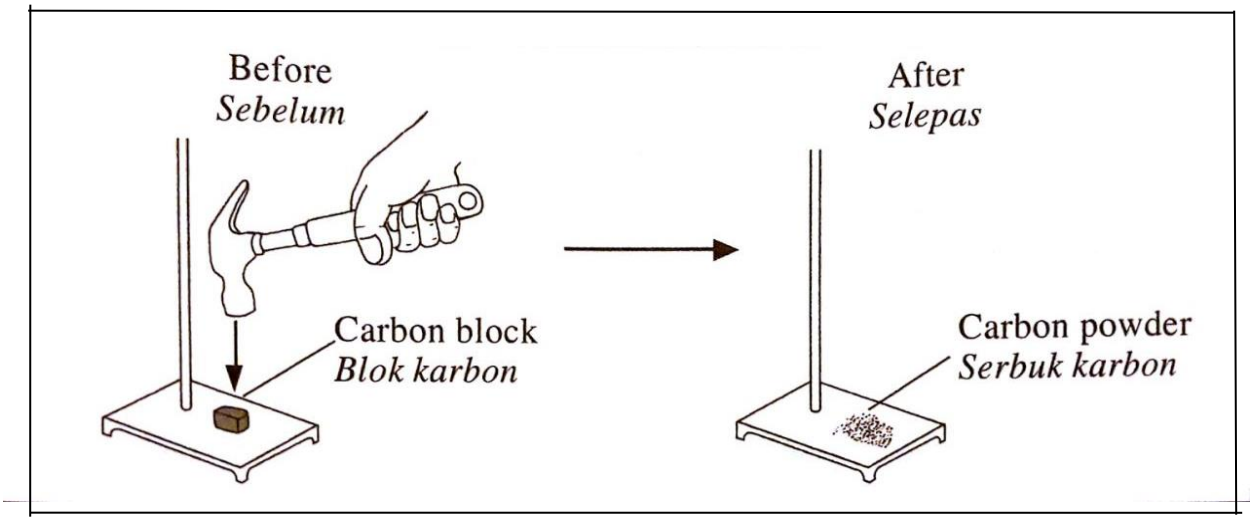


Diagram 3.2
Rajah 3.2

(a) Based on Diagram 3.2,
Berdasarkan Rajah 3.2,

(i) State **one** observation for this experiment.
*Nyatakan **satu** pemerhatian dalam eksperimen ini.*

……

……

(ii) State **one** inference for your your answer in 3(a)(i).
*Nyatakan **satu** inferens bagi jawapan anda di 3(a)(i).*

……..

……..

[2 marks / 2 *markah*]

(b) State the responding variable in this experiment.
Nyatakan pemboleh ubah bergerak balas dalam eksperimen ini.

……

[1 mark / 1 *markah*]

(c) Mark (√)in the boxes provided the material which has the same characteristics as material in Diagram 3.2.
Tandakan (√) pada kotak yang disediakan bagi bahan yang mempunyai ciri yang sama dengan bahan dalam Rajah 32.

Iron
Besi ☐

Sulphur
Sulfur ☐

[1 mark / 1 *markah*]

(d) Copper is ametal. Based on this experiment, state teh operational definition of metal.
Kuprum adalah logam.Berdasarkan eksperimen ini, nyatakan operasi secara definisi bagin logam.

……..

……..

[1 mark / 1 *markah*]

SECTION B
BAHAGIAN B

4.1 Change of state of matter
4.1 Perubahan keadaan jirim

4. Diagram 4 shows the change of state of matter.
Rajah 4 menunjukkan perubahan keadaan jirim.

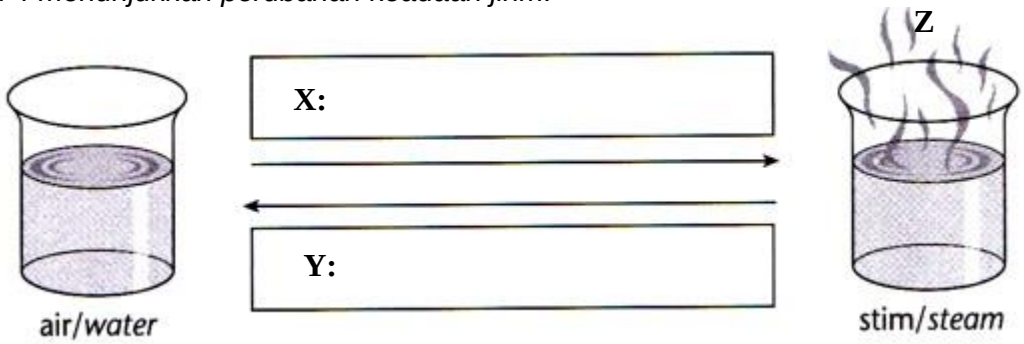


Diagram 4
Rajah 4

(a) Name the processes X and Y
Namakan proses X *dan* Y

X:……..

Y:……

[2 marks / 2 *markah*]

(b) Draw the arrangement of particles of state Z in the space provided below.
Lukis susunan zarah-zarah dalam keadaan Z *di ruang yang disediakan di bawah.*

[1 mark / 1 *markah*]

(c) What happens to to the movement of the particles in water during process X?
Apakah yang berlaku pada pergerakan zarah-zarah air semasa proses X?

……

[1 mark / 1 *markah*]

(d) A student pour ice blended drink into a glass. He found that the ice in the drink has melted. In your opinion, how the change of the ice to water occur?
Seorang pelajar menuangkan minuman ais kisar ke dalam gelas. Dia mendapati bahawa ais dalam minuman tersebut telah cair. Pada pendapat anda, bagaimanakah perubahan ais kepada air itu berlaku?

……

……

[2 marks / 2 *markah*]

4.2 Atomic structure
Struktur atom

4.3 Proton Number and Nucleon Number
Nombor Proton dan Nombor Nukleon

5. Diagram 5 shows the structure of atom P
Rajah 5 *menunjukkan struktur atom* P

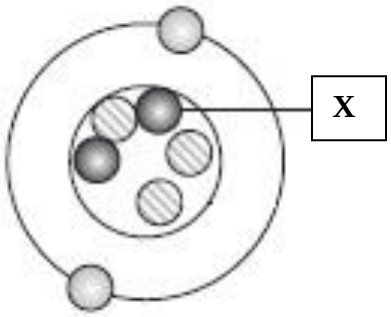


Diagram 5
Rajah 5

(a) Based on diagram 5,
Berdasarkan rajah 5,

i) X is subatomic particle. Name X.
X *adalah zarah subatom. Namakan* X.

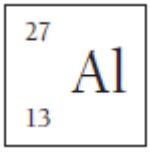
……

ii) What is the nucleon number of atom P
Apakah nombor nukleon bagi atom P

……

[2 marks / 2 *markah*]

(b)



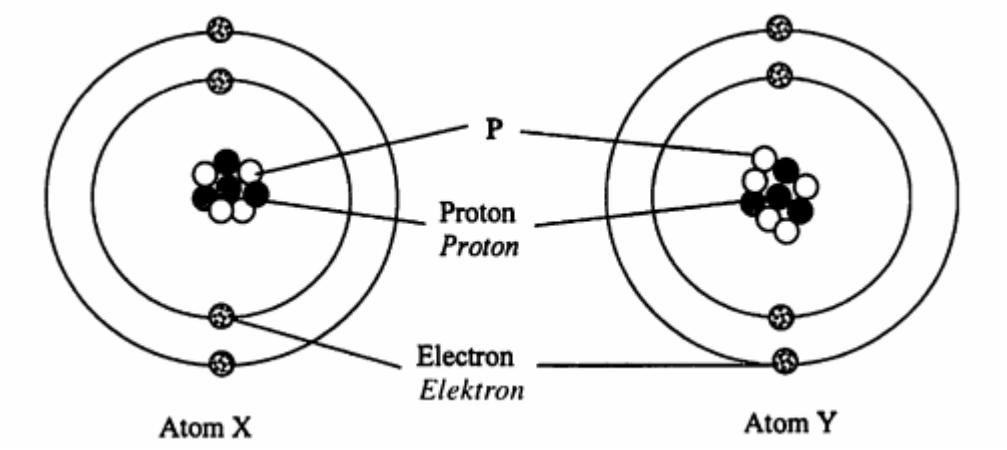
Explain the relationship between the proton number and electron for the atom above.
Jelaskan hubungan antara nombor proton dan bilangan elektron bagi atom di atas.

……

……

[2 marks / 2 *markah*]

(c)



(i) Why atom X and atom Y are isotope?
Mengapakah atom X *dan atom* Y *adalah isotop*?

……

[1 mark / 1 *markah*]

(ii) Name one example of isotope
Namakan satu contoh isotop

……

[1 mark / 1 *markah*]

4.4 Periodic Table
4.4 Jadual Berkala

6. Diagram 6 shows an incomplete Periodic Table.
Rajah 6 menunjukkan lakaran Jadual Berkala yang tidak lengkap.

I								VIII
	II		III	IV	V	VI	VII	
				J				
K								*L*
	M	*N*						*P*

Diagram 6
Rajah 6

(a) How are the elements in the Periodic Table arranged?
Bagaimanakah unsur-unsur dalam Jadual Berkala disusun?

.....

[1 mark / 1 markah]

(b) Based on Diagram 6, state
Berdasarkan Rajah 6, nyatakan

(i) the type of element N
jenis unsur N

.....

(ii) the element with the biggest proton number.
unsur yang mempunyai nombor proton paling besar.

.....

[2 marks / 2 markah]

(c) State the changes of element type from K to L in the Periodic Table.
Nyatakan perubahan jenis unsur dari K ke L dalam Jadual Berkala.

.....

[1 mark / 1 markah]

(d) State one similar characteristic between element L and element P.
Nyatakan satu sifat yang sama antara unsur L dan unsur P

.....

[1 mark / 1 markah]

(e) Name the gas released from the reaction between element K with water.
Namakan gas yang terhasil dari tindak balas antara unsur K dengan air.

.....

[1 mark / 1 markah]

4.7 Method of Purifying Substances
4.7 Kaedah Penulenan Bahan

7 Diagram 7.1 and 7.2 show the apparatus set up in an experiment to separate salt from its solution.
Rajah 7.1 dan 7.2 menunjukkan radas eksperimen untuk mengasingkan garam dari larutannya.

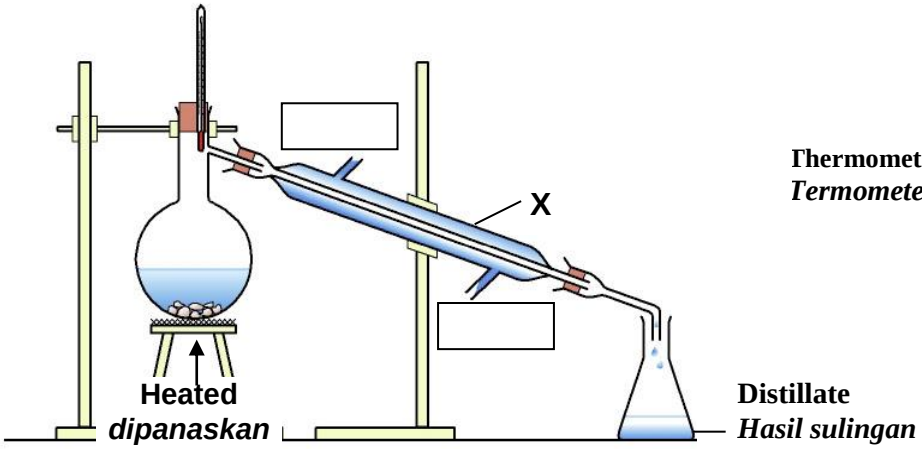


Diagram 7.1
Rajah 7.1

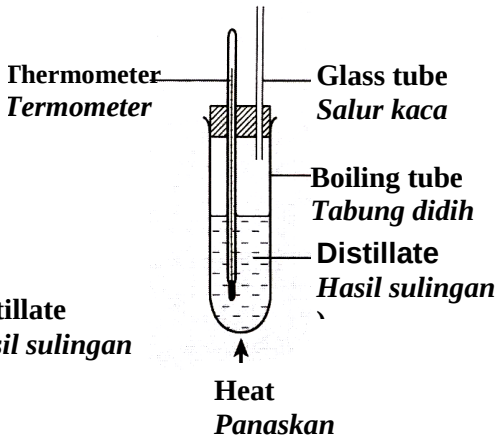


Diagram 7.2
Rajah 7.2

(a) Name the process shown in Diagram 7.1
Namakan proses yang ditunjukkan dalam Rajah 7.1

……..... [1 mark / 1 *markah*]

(b) (i) Name the apparatus labelled X?
Namakan radas yang dilabelkan X ?

……

(ii) What is the function of X?
Apakah fungsi X?

……
[2 markah / 2 *markah*]

Fill 'P' and 'Q' in the suitable boxes of Diagram 7.1 .
Isikan huruf 'P' dan 'Q' dalam petak yang sesuai pada Rajah 7.1

P : Water outlet *Air keluar*	**Q** : Water inlet *Air masuk*

[1 mark / 1 *markah*]

(d) What is the boiling point of the distillate in Diagram 7.2 ?
Apakah takat didih hasil sulingan dalam rajah 7.2?

.....

[1 mark / 1 *markah*]

(e) State one process that involved changes in states of matter in this experiment.
Nyatakan satu proses yang melibatkan perubahan keadaan jirim dalam eksperimen ini

.....

[1 mark / 1 *markah*]

SECTION C
BAHAGIAN C

7. Study the following statement:
Kaji pernyataan berikut:

The boiling point of salt solution is higher than distilled water *Takat didih larutan garam adalah lebih tinggi daripada air suling*

(a) Suggest one hypothesis to investigate the above statement.
Cadangkan satu hipotesis untuk menyiasat pernyataan di atas.

[1 mark / 1 *markah*]

(b) Using two beakers, Bunsen burner, distilled water, salt and other apparatus, describe one experiment to test your hypothesis in 7.(a) based on the following criteria:
Menggunakan dua bikar, penunu Bunsen, air suling, garam dan radas-radas lain, huraikan satu eksperimen untuk menguji hipotesis anda di 7(a) berdasarkan kriteria berikut:

(i) The aim of the experiment [1 mark / 1 *markah*]
Tujuan eksperimen

(ii) The identification of variables [2 marks / 2 *markah*]
Mengenal pasti pembolehubah

(iii) The list of apparatus and materials [1 mark / 1 *markah*]
Senarai radas dan bahan

(iv) The procedure or method [4 marks / 4 *markah*]
Prosedur atau kaedah

(v) The tabulation of data [1 mark / 1 *markah*]
Penjadualan data

8. (a) Diagram 8.1 shows clay pots which are made of non-metals.
State **four** physical properties of non-metals.
Rajah 8.1 *menunjukkan pasu tembikar yang diperbuat daripada bahan bukan logam.*
Nyatakan ***empat*** *sifat fizikal bagi bukan logam.*

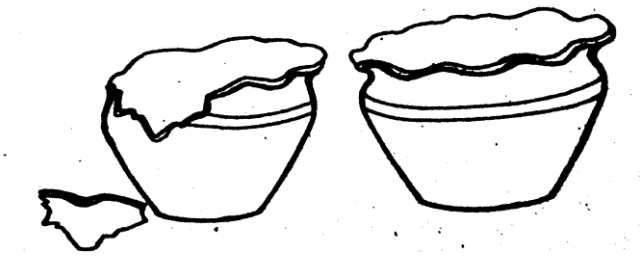


Diagram 8.1
Rajah 8.1

[4 marks / 4 *markah*]

(b) Metal is used to make object for cooking utensils such as metal ladle and aluminium pan
Logam digunakan untuk membuat barang peralatan memasak seperti senduk logam dan kuali aluminium

In your opinion, is it suitable to use metal to make cooking utensils as given above? Give reasons to support your opinion.
Pada pendapat anda, adakah sesuai logam digunakan untuk membuat barang peralatan memasak seperti di atas?
Berikan alasan untuk menyokong pendapat anda.

[6 marks / 6 *markah*]