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| 1 | Diagram 1.1 shows the apparatus set-up for an experiment to investigate the effect of temperature on the rate of diffusion. The experiment is repeated by using different temperatures. *Rajah* 1.1 *menunjukkan susunan radas bagi satu eksperimen untuk mengkaji kesan suhu ke atas kadar resapan. Eksperimen diulang dengan menggunakan suhu yang berbeza.*Zinc plate *Plat zink* Zinc plate *Plat zink*   Diagram / Rajah 1.1 The experiment is carried out for 3 sets that is at **35 oC , 40 oC** and **45 oC***Eksperimen dijalankan untuk* 3 *set iaitu pada* **35 oC , 40 oC** *dan* **45 oC**(a) For this experiment, state  *Bagi eksperimen ini, nyatakan* (i) the manipulated variable : ........................................................................................................... *pemboleh ubah dimanipulasikan* (ii) the responding variable: .........…………………………………................................................ *pemboleh ubah bergerak balas* (iii) the fixed variable:....................................................................................................................... *pemboleh ubah dimalarkan* [3 marks/ *markah* ](b) Record the readings of the stopwatch in the space provided in Diagram 1.2 *Rekod bacaan jam randik di dalam ruang yang disediakan dalam Rajah* 1.2Set I: **35 oC***Set* I Set II: **40 oC***Set* II Set III: **45 oC***Set* III Diagram / *Rajah* 1.2 [3 marks/ *markah* ] |
|  | (c) Construct a table to record the temperature and time taken for the brown gas to diffuse into another gas jar when the glass plate is removed. *Bina satu jadual untuk merekod suhu dan masa yang diambil bagi gas perang itu meresap ke* *dalam balang gas yang satu lagi apabila kepingan kaca dialihkan.* [3 marks/ *markah* ] |
|  | (d) State the relationship between temperature and the rate of diffusion. *Nyatakan hubungan antara suhu dengan kadar resapan.* ............................................................................................................................................................... .............................................................................................................................................................[3 marks/ *markah* ]  |
|  | (e) The experiment in Set I is repeated by placing the gas jars in a container filled with ice. Predict the rate of diffusion. Explain why. *Eksperimen itu diulang di Set* I *dengan meletakkan balang gas dalam bekas yang*  *mengandungi ais*.  *Ramalkan kadar resapan. Terangkan mengapa.*…………………………………………………………………………………………………….. …………………………………………………………………………………………………….[3 marks/ *markah* ]  |
|  | (f) State the operational definition of rate of diffusion in this experiment. *Nyatakan definisi operasi bagi kadar resapan eksperimen ini.*.............................................................................................................................................................. *.............................................................................................................................................................* [3 marks/ *markah* ]  |
|  | (g) Diagram 1.3 shows two examples of diffusion. *Rajah* 1.3 *menunjukkan dua contoh resapan.*

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| X: A tea bag immersed in water at room temperatureX: *Satu uncang teh direndam dalam air* *pada suhu bilik* | Y: Perfume is sprayed at room temperatureY: *Minyak wangi disembur pada suhu bilik* |
| Cup Tea Bag Isolated White Background Mug Hot Herbal Drinks ...Tea bag*Uncang teh* | HomePerfume*Minyak wangi* |

 Diagram / *Rajah* 1.3Which example has the higher rate of diffusion? Explain why.*Contoh yang manakah mempunyoi kadar resapan yang lebih tinggi*? *Terangkan mengapa.*………………………………………………………………………………………………………….………………………………………………………………………………………………………….[3 marks/ *markah* ]  |

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| 2. | Diagram 2.1 shows the conversation between Dania and Dani.*Rajah* 2.1 *menunjukkan perbualan antara Dania dan Dani*.How do you know which salt is soluble in water and which salt is not?*Bagaimana kamu tahu garam yang manakah larut dalam air dan garam yang tidak* ?Muslim children in science gown on white Vector ImageLet us investigate the solubility of these salts in water.*Mari kita kaji keterlarutan garam ini dalam air*  Diagram / Rajah 2.1  Table 2.1 shows Experiment I, II and III which are conducted by Dania and Dani to study the solubility of salts in water. They poured 2 cm3 of distilled water into a test-tube and then put in 1 spatula of zinc nitrate salt . They repeated the experiment with two other salts.*Jadual* 2.1 *menunjukkan Eksperimen* I, II *dan* III *yang dijalankan oleh Dania dan Dani untuk mengkaji keterlarutan garam dalam air. Mereka menuangkan* 2 cm3 *air suling ke dalam tabung uji dan memasukkan* 1 *spatula garam zink nitrat. Mereka mengulang eksperimen itu dengan dua* *garam yang lain.*

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| **Experiment** ***Eksperimen***  | **Reaction*****Tindak balas*** |
| I |  \_ \_ \_ \_\_ \_ \_ \_\_ \_ \_ \_\_ \_ \_ \_\_ \_ \_ \_\_ \_ \_ \_\_ \_ \_ \_\_ \_ \_ \_\_ \_ \_ \_\_ \_ \_ \_\_ \_ \_ \_\_ \_ \_ \_\_ \_ \_ \_\_ \_ \_ \_\_ \_ \_ \_\_ \_ \_ \_\_ \_ \_ \_\_ \_ \_ \_ water*air*Copper(II) nitrate*Kuprum*(II) *nitrat* |
| II | \_ \_ \_ \_\_ \_ \_ \_\_ \_ \_ \_\_ \_ \_ \_\_ \_ \_ \_\_ \_ \_ \_\_ \_ \_ \_\_ \_ \_ \_\_ \_ \_ \_\_ \_ \_ \_\_ \_ \_ \_\_ \_ \_ \_\_ \_ \_ \_\_ \_ \_ \_\_ \_ \_ \_\_ \_ \_ \_\_ \_ \_ \_\_ \_ \_ \_water *air*  Copper(II)carbonate *Kuprum*(II)*karbonat* |
| III | \_ \_ \_ \_\_ \_ \_ \_\_ \_ \_ \_\_ \_ \_ \_\_ \_ \_ \_\_ \_ \_ \_\_ \_ \_ \_\_ \_ \_ \_\_ \_ \_ \_\_ \_ \_ \_\_ \_ \_ \_\_ \_ \_ \_\_ \_ \_ \_\_ \_ \_ \_\_ \_ \_ \_\_ \_ \_ \_\_ \_ \_ \_\_ \_ \_ \_ water *air* Lead(II)sulphate*Plumbum* (II) *sulfat* |

 Diagram / Rajah 2.1 (a) State observation and the corresponding inferences for Experiment I, II and III. *Nyatakan pemerhatian dan inferens yang sepadan bagi Eksperimen* I, II *dan* III.

|  |  |
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| **Observation*****Pemerhatian*** | **Inferences*****Inferen*** |
| I |  |
| II  |  |
| III  |  |

 [6 marks/ *markah* ](b) State one hypothesis for this experiment. *Nyatakan satu hipotesis bagi experiment ini.* ............................................................................................................................................................... ..........................................................................................................................................................[3 marks/ *markah* ]   |
|  | (c) Salts are ionic compounds with high melting and boiling points.  Classify the substances in the box below into ionic compound and not ionic compound. *Garam adalah sebatian ion yang mempunyai takat lebur dan takat didh yang tinggi.* *Kelaskan bahan-bahan di dalam kotak di bawah kepada sebatian ion dan bukan sebatian ion.*

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| Copper Iron(II) chloride Sodium oxide Nitrogen gas*Kuprum Ferum*(II) *klorida Natrium oksida* *Gas nitrogen* |

|  |  |
| --- | --- |
| **Ionic compound*****Sebatian ion*** | **Not ionic compound*****Bukan sebatian ion*** |
|  |  |

 [3 marks/ *markah* ] |

3. Diagram 3.1 shows butter and peanut oil.

 Butter is a saturated compound while peanut oil is an unsaturated compound.

 *Rajah* 3.1 *menunjukkan mentega dan minyak kacang.*

 *Mentega adalah sebatian tepu manakala minyak kacang adalah sebatian tak tepu*

**

Peanut oil  *Minyak kacang*

 Butter

 *Mentega*

 Peanut oil

 *Minyak kacang*

 Butter

 *Mentega*

 Diagram/ *Rajah* 3.1

The chemical properties of an unsaturated compound and saturated compound can be shown by the hydrocarbons, alkane and the alkene.

By using the hydrocarbons with the number of carbons **5** or **6**, plan a laboratory experiment to differentiate both hydrocarbons. Use the information below in your planning.

*Sifat kimia sebatian tepu dan sebatian tak tepu boleh ditunjukkan oleh hidrokarbon, alkana dan alkena. Dengan menggunakan hidrokarbon bernombor karbon* **5** *atau* **6***, rancangkan satu eksperimen makmal untuk membezakan kedua-dua hidrokarbon ini. Guna maklumat yang di berikan untuk perancangan anda.*

|  |  |
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| **Hydrocarbon*****Hidrokarbon*** | **General formula*****Formula am*** |
| Alkane*Alkana* | **CnH2n+2** |
| Alkene*Alkena* | **CnH2n** |
| Use **bromine water** or **acidified potassium manganate(VII) solution** as reagents*Guna* ***air bromin*** *atau* ***larutan kalium manganat*(VII) *berasid*** *sebagai reagen* |

Your planning should include the following aspects:

*Perancangan anda hendaklah mengandungi aspek-aspek berikut* :

(a) Problem statement

 *Pernyataan masalah*

(b) All the variables

 *Semua pemboleh ubah*

(c) Statement of the hypothesis

 *Pernyataan hipotesis*

(d) List of substances and apparatus

 *Senarai bahan dan radas*

(e) Procedure for the experiment

 *Prosedur eksperimen*

(f) Tabulation of data

 *Penjadualan data*

[17 marks/ *markah*]