MODUL
PERKEMBANGAN PEMBELAJARAN
SPM 2019

Skema MPP3

KIMIA

JABATAN PELAJARAN TERENGGANU

Mark Sheet Paper 1 PERCUBAAN

CHEMISTRY SPM 2019

1	B
2	B
3	B
4	B
5	A
6	D
7	C
8	B
9	D
10	B
11	D
12	A
13	B
14	C
15	C
16	D
17	B
18	A
19	D
20	D

21	A
22	C
23	C
24	A
25	D
26	C
27	D
28	C
29	D
30	A
31	C
32	D
33	A
34	A
35	D
36	A
37	B
38	A
39	C
40	D

41	B
42	D
43	C
44	B
45	B
46	A
47	D
48	C
49	C
50	A

MPP3 2019 SIJIL PELAJARAN MALAYSIA 4541/2 CHEMISTRY *Paper* 2

Section A

1	(a)		Saponification *Safonifikasi*		1
	(b)		Sodium hydroxide *Natrium hidroksida*		1
	(c)		To reduce solubility of soap *Untuk mengurangkan keterlarutan sabun*		1
	(d)	(i)	Mg^{2+} and Ca^{2+}	1+1	..2
		m	-soap anion react with ion Mg^{2+} / Ca^{z+} -produced scum / insoluble salt *-anion sabun bertindakbalas dengan ion* Mg^{2+} / Ca^{z+} *-manghasiikan kekat/ garam tak tedarutkan.*	1 1	..2
		(Si)	Detergent/Defergen *Detergent does not Form a scum* / *Detergent tidak membentuk kekat*	1	
			TOTAL		9

2	(a)		Horizontal rows in periodic table *Baris mendatar di dalam jadual berkala*		1
	(b)		3		1
	<c)		White *putih*		1
	(d)		Acidic property: Oxide of T *TOksida* Amphoteric property: Oxide of R *R Oksida*	1 1	...2
	(e)	(i)	Correct formulae of reactant and products Balanced equation 4Na + Oz + -» $2Na_20$	1 1	...2
		(")	Ionic compound *Sebatian ion*		1
		(iii)	0.1 mol		1
			TOTAL		9

(a) (i) formula that show the actual number of atom of each element in a compound//
formula yang menunjukkan bilangan sebenar atom setiap unsur dalam sebatian

(ID C_2Hs

(iii) *Reactants/bah an tindak balas* : pro pen *e/prop* ena/C 3 H B and Oxygen *toksigent* O_2

Products/has// *tindak balas:* And/c/an Carbon dioxide/ *karbon dioksida/*$C0_2$ *and/dan* water/ a/r/FLO

Number of mole/ Bilangan mol:
1 mol of propene/C_3Ha reacts with 5 mol of oxygen/0_2 to produce 3 mol of carbon dioxide/$C0_2$ and 4 mol of water/H_20 *1 mol propena/* C_3H_8 *bertindakbalas dengan 5 mol oksigen/* 0_2*menghasilkan 3 mol karbon dtoksida/*$C0_2$ *dan 4 mol air/* H_2O

(b) (i)

	M	Oksigen
Jisim /g	44.75-39.25 = 5.50	47.95-44.75 = 3.20
Bil mol /mol	5.50/55 = 0.1	3.2/16 = 0.2
// Nisbah	0.1/0.1 = 1	0.2/0.1 =2

Formula Empirik : MO2

(ii) $2H_a + M0_2$ -» $2H_20 + M$ **1+1**

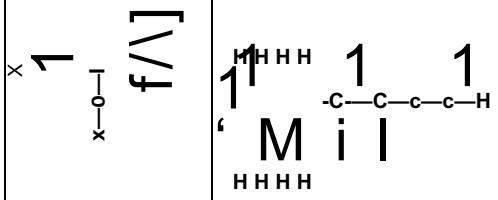
Dry hydrogen gas is flowed several minutes into the combustion tube before M oxide is heated//
During the process of cooling the hydrogen gas should continue to flow//
The process of heating, cooling and weighing are repeated until the constant mass is obtain

gas hidrogen kering dialirkan beberapa minit ke dalam tiub pembakaran sebelum oksida M dtpanaskan//
Semasa proses penyejukkan gas hidrogen perlu terus dialirkan//
proses pemanasan, penyejukkan dan penimbangan diulangi sehingga mendapat jisim yang tetap.

TOTAL **10**

4	(a)		$Pb(N0_3)_2$		1
	(b)	(i)	Oxygen and nitrogen dioxide *II oksigen dan nitrogen dioksida*		1
		(ii)	$2Pb(N0_3)_a$ -+ $2PbO + 4N0_2 + O_z$	1+1	.2
		{iii)	No. of moles of $Pb(N0_3)_2$ = 33J. *II*0.1 331 Mass of PbO = 0.1 x 223 // 22.3g	1 1	...2
	(c)	(I)	lead(ll) carbonate// *Plumbum* (II) *karbonat*		1
		(ii)	Precipitation / double decomposition reaction // *Tindak balas pemendakan* / *penguraian ganda dua.*		1
		(iii)	$Pb(N0_3)_2 + Na_2C0_3$ — $PbC0_3 + 2NaN0_3$	1 + 1	...2
			TOTAL		10

5	(a)	(0	the change in the quantity of reactant or products per unit time *perubahan dalam kuantiti bahan tindak balas atau basil tindak balas per unit masa*		1
		(ii)	The volume of CO2 released *fsipadu C02dibeba$kan II* mass of CaC03 *jisim* CaCOs		1
		(iii)	Alt HCl react completely *Semua HCl telah habis bertindakbalas*		1
	(b)		$CaC0_3$ + 2HCl $CaCl_2$ + $C0_2$ + H_20 Correct formulae of reactant and products Balanced equation	1 1	**…2**
	(c)	(i)	*No of* mole *of HCl: 40 x* 0.5 1000 //0.02 mol 2 mol HCl -> 1 mol $C0_2$ *II* 0.02 mol HCl -> 0.01 mol $C0_2$ Volume of gas =0.01 x 24 // 0.24 dm^3	1 1 1	3
		(ii)	Average rate of reaction = 0.667 cm^3s^{-1} *Kadar tindak balas purata* = 240 360//0.667 cmV		1
		(Hi)	Flow the gas into lime water Lime water turns cloudy *Alirkan gas ke dalam air kapur Air kapur menjadi keruh*	1 1	2
			TOTAL		11

6	**(a)**		Alcohol alkohol		**1**
	(b)	(i)	Acidified potassium manganate (VII) solution *Larutan kalium manganat* (VII) *berasidl* Acidified potassium dichromate(VI) solution. *Larutan kalium dikromat(V\) berasid.*		**1**
		(ii)	**C_2H_sOH + 2(0) —►** CHsCOOH + H2O	**1+1**	**..2**
		(iii)	Put Mg strip/ suitable metal into the test tube that contained compound V solution. Colourless bubble gas produced.// *Masukkan kepingan* Mg/ *logam yang sesuai ke dalam tabung uji yang berisi larutan sebatian* Y. *Getembung gas tidak berwama terhasil II* Put CaCOs into the test tube that contained compound Y solution. Effervescent occurred. *Masukkan* CaCOa *ke dalam tabung uji yang berisi larutan sebatian* Y. *Pembuakan beriaku.*	**1** **1** **..2**
		(iv)	Compound Y **:** Ethanoic acid*/ asid etanoik*		**1**
	(c)	**(i)**	Esterification/ pengesteran		**1**
		(ii)		**1+1**	
		(iii)	Compound 2: Buthyl ethanoate/ *Butil etanoat*		
			TOTAL		11

7	**(a)**		<table><tr><td>Glacial ethanoic acid *Asid etanoik glasial*</td><td>Ethanoic acid + water Asid *etanoik + air*</td></tr><tr><td>Molecules *Molekul-molekul*</td><td>Molecules and ions/ ion *Molekul-molekul dan ion-ion /ion*</td></tr><tr><td>Not show the property of acid *Tidak menunjukkan sifat asid*</td><td>Show the property of acid *Menunjukkan sifat asid*</td></tr><tr><td>Hydrogen ions do not exist *Ion hidrogen tidak wujud*</td><td>Hydrogen ions exist *Ion hidrogen wujud*</td></tr></table>	1+1 **1** **1**	...4
	(b)		$2NaOH + H_2S0_4$ $Na_2S0_4 + 2H_2Q$ 25 * 0.1 *= 1 Mb x 25 2 Mb = 0.2 mol dm'^{3}	1+1 1+1 1	...5
	(c)	(!)	1. P = Ethanoic acid / Asid etanoik 2, Q = Hydrochloric acid / asid hidroklorik <table><tr><td>P</td><td>Q</td></tr><tr><td>Weak acid *H asid lemah //* ionised partially in water *tl mengion separa dalam air*</td><td>Strong acid *H asid kuat it* ionised completely in water //mengion lengkap dalam air</td></tr><tr><td>Produce lower concentration of H^+ ions // *kepekatan ion H* rendah*</td><td>higher concentration of H^+ ions // *kepekatan ion hi* tinggi*</td></tr><tr><td colspan="2">concentration of H^+ higher pH value lower *kepekatan ion hi* tinggi nilai pH rendah*</td></tr></table>	1 1 1 1 1	...5
		(!')	Hydrogen // hidrogen Collect the gas into the test tube Place the lighted wooden splinter in the mouth of the test tube Produce pop sound Kumpul gas ke dalam tabung uji. Masukkan kayu uji menyata ke dalam mulut tabung uji. Bunyi pop terhasil. $2HCl + Mg$ $MgCl_2 + H_2$ *[Balance chemical equation]* [*Correct formula of reactant and product]*	1 1 1 1 1 1	**...6**
			TOTAL		20

8	(a)	(i)	Zinc - +2 Femm = +3	1 1.....2
		00	Zink chloride Ferum (III) oxide	1 1 2
	(b)	0)	Reaction I - Not redox reaction [suitable chemical equation of neutralisation] [show oxidation number of elements] -No change in oxidation number of elements - Tindak balas I - Bukan tindakbalas redoks [persamaan kimia bagi peneutralan yang sesuai] [tunjuk nombor pengoksidaan bagi setiap unsur] -tiada perubahan nombor pengoksidaan bagi setiap unsur	1 1 1....3
		(ii)	Reaction II -Redox reaction [suitable chemical equation of displacement of metal [Show oxidation number of elements] -Have a change in oxidation number Tindak balas II -Tindakbalas redoks [persamaan kimia bagi penyesaran logam yang sesuai] [Tunjuk nombor pengoksidaan bagi setiap unsur] - terdapat perubahan nombor pengoksidaan	1 1 1.....3
	(c)	(i)	P -Cu//Sn//Pb Q- Mg//Zn//Al	1 1 2
		(ii)	Set 1 ion Fe^{2+} are produced -Iron is more electropositive than P// iron loses electron to formed Fe^{2+} . Fe-------> Fe^{2*} + 2e - Iron is oxidised Set 2 -OH' ion is present. - Fe is less electropositive than Q // Q loses electron to formed ion Q - Q - > Q^{2+} + 2e - Q is oxidised Set 1 ion Fe^{2+} *terbentuk* -Fe *iebih elektropositif berbanding* P// Fe *kebilangan electron membentuk ion* Fe^{2*} - Fe-------> Fe^{2+} + 2e -Fe *dioksidakan* Set 2 *Ion* OH *hadir.* -Fe *kurang elektropositif berbanding* Q, *maka* Q *kehilangan electron membentuk ion* Q - Q--------> Q^{2+} + 2e -Q dioksidakan.	1 1 1 1 1 1 1 1....8

			TOTAL	20

9	(a)		Sample answer *11 Conloh iawaoan* NaCl/ Sodium chloride// *natrium klorida* 2Ch -+Cl2 + 2e Oxygen *Ii oksigen* The position of OH' ion lower than Cl' in the electrochemical series// *Kedudukan ion OH'di bawah ion* Cl" *dalam siri elektrokimia*	1 1 1 1	...*A*
	(b)		Sample answer *it Contoh iawaoan* X : zinc *it zink* Y : Copper *11 kuprum* Z: Silver // *argentum* Set 1: Reaction occurred because X / zinc more electropositive than Y /copper// *Tindak balas bertaku kerana* X / *zink lebih elektropositif daripada* Y / *kuprum* Set II: Reaction occurred because Y / copper more electropositive than Z /silver// *Tindak balas berlaku kerana* Y / *copper lebih elektropositif* daripada Z / *argentum* Set III: Reaction does not occurred because Z less electropositive than X// *Tindak balas tidak berlaku kerana* Z *kurang elektropositif daripada* X	1 1 1 1 1 1	**…6**

	(C)		Sample answer *It Contoh iawaoan* 1. Copper *H kuprum* 2. Materia!and apparatus *I! bahan dan radas:* Copper(II)sulphate solution///aru/an *kuprum(\\) sulfat*, pure copper plate // *kepingan kuprum tulen,* impure copper plate // *kepingan kuprum tak tulen,* beaker // *bikar,* battery///) a feri, connecting wire // *wayar penyambung* 3. [functional diagram // *Rajah berfungsi*] 4. [Labelled // *dilabel*l 5. Copper (II) sulphate solution is poured into a beaker // *Larutan kuprum{\\) sulfat di tuang ke dalam sebuah bikar,* 6. Apure copper plate and impure copper plate are used as cathode and anode respectively. *Kepingan kuprum tulen dan kepingan kuprum tak tulen masing-masing digunakan sebagai katod dan anod.* 7. Both plates are immersed in the solution // *kedua-dua kepingan di celup dalam larutan* 8. The circuit is completed // *Litar dilengkapkan* // The switch is turned on*H Suis dipasang* 9. Anode// Anod : Cu -* Cu^{2*} + 2e 10. Cathode // Katod : Cu^{2+} + 2e -* Cu	1 1 1 1 1 1 1 1 1 1	..10
			TOTAL		20

10	**(a)**		M = Zinc / Zink [metal above Pb in ECS] No of mol of Pb = 0.5 x 100 1000 = 0.05 Heat produced = 0.05 x 112 x 1000 J mc0 = 5600 J 0 = 13.33 °C	1 1 1 1	...4
	(b)	(i)	Acid Q = Hydrochloric acid/ Nitric acid *Asid* Q = *Asid hidroklorik/asid nitric* Acid P = Ethanoic acid *Asid* P = *Asid etanoik* Heat of neutralisation in set II is higher than set I. *Haba peneutralan bagi set* II *lebih tinggi daripada set* I Acid Q is a strong acid whereas Acid P is a weak acid *Asid Q ialah asid kuat manakala asid P ialah asid lemah* Acid Q dissociates completely in water whereas Acid P dissociates partially in water. *Asid Q bercerai lengkap dalam air manakala asid* P *bercerai separa dalam air.* Some of heat released is used to dissociate the molecules of acid P completely. *Sebahagian haba yang dibebas digunakan untuk penceraian molekul asid* P *dengan lengkap.*	1 1 1 1 1 1	**. . . 6**
	(b)	(ii)	Procedure: Prosedur 1. Measure 50 cm^3 of 1.0 moldm'^{3} potassium hydroxide and pour into polystyrene cup. 1, *Sukat* 50cm^3 *larutan kalium hidroksida* 1.0 $moldm^{-3}$ *dan dituang ke dalam cawan polisterin.* 2. Measure 50 cm^3 of 1.0 moldm-3 hydrocloric acid and pour into polystyrene cup. 2. *Sukat* 50 cm^3 *larutan asid hidroklorik* 1.0 moldm ^{3}	**1** 1	

			dan dituang ke dalam cawan polisterin. 3. Measure the initial temperature of the two solutions and recorded. *S.Sukat suhu aw a! bagi kedua-dua larutan dan direkod.* 4. Pour the hydrochloric acid into the sodium hydroxide solution. 4. *Tuang asid hidmklorik kedalam larutan kalium hidroksida* 5. The mixture is stirred and the highest temperature is recorded 5. *larutan campuran dikacau dan suhu tertinggi direkod* Chemical equation: KOH + HCI —► KCI + H20 Calculation: Heat change = mc9 = (50+50)(4.2)OVTi) = 420(Ta-Ti) No of mol H^+/OH- = MV 1000 = 1.0f50) 1000 Heat of neutralisation =420(T2-Ti) Jmol-1 Haba peneutralan 0.1 = - 420nVTi) kJmol-1 0.1 x 1000	1 1 1 1+1 1 1 1	..10
			TOTAL		20