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 |

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| --- | --- |
| 41 | B |
| 42 | D |
| 43 | C |
| 44 | B |
| 45 | B |
| 46 | A |
| 47 | D |
| 48 | C |
| 49 | C |
| 50 | A |
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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) | Mg2+ and Ca2+ | 1+1 | ..2 |
|  |  | m | -soap anion react with ion Mg2+ / Caz+  -produced scum / insoluble salt  -anion sabun bertindakbalas dengan ion Mg2+ / Caz+  -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 + -» 2Na20 | 1  1 | ...2 |
|  |  | (") | Ionic compound Sebatian ion |  | 1 |
|  |  | (iii) | 0.1 mol |  | 1 |
|  |  |  | TOTAL | 9 | |

formula that show the actual number of atom of each element in a compound//

(a)

(i)

(ID

(iii)

formula yang menunjukkan bilangan sebenar atom setiap unsur dalam sebatian

C2Hs

Reactants/bah an tindak balas : pro pen e/prop ena/C 3 H B and Oxygen toksigent O*2*

And/c/an

Products/has// tindak balas:

Carbon dioxide/ karbon dioksida/C02 and/dan water/ a/r/FLO

Number of mole/ Bilangan mol:

1 mol of propene/C3Ha reacts with 5 mol of oxygen/02 to produce 3 mol of carbon dioxide/C02 and 4 mol of water/H20 1 mol propena/ C3H8 bertindakbalas dengan 5 mol oksigen/ 02menghasilkan 3 mol karbon dtoksida/C02 dan 4 mol air/ H2O

|  |  |  |
| --- | --- | --- |
|  | 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

(b)

(i)

(ii)

1+1

2Ha + M02 -» 2H20 + M

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.

10

TOTAL

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 4 | (a) |  | Pb(N03)2 |  | 1 |
|  | (b) | (i) | Oxygen and nitrogen dioxide II oksigen dan nitrogen dioksida |  | 1 |
|  |  | (ii) | 2Pb(N03)a -+ 2PbO +4N02 + Oz | 1+1 | .2 |
|  |  | {iii) | No. of moles of Pb(N03)2 = 33J. II0.1 331  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(N03)2 + Na2C03 — PbC03 + 2NaN03 | 1 + 1 | ...2 |
|  |  | | TOTAL | 10 | |

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| 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 HCI react completely  Semua HCI telah habis bertindakbalas |  | 1 |
|  | (b) |  | CaC03 + 2HCI CaCI2 + C02 + H20  Correct formulae of reactant and products Balanced equation | 1  1 | ...2 |
|  | (c) | (i) | No of mole of HCI: 40 x 0.5  1000 //0.02 mol 2 mol HCI -> 1 mol C02 II 0.02 mol HCI -> 0.01 mol C02 Volume of gas =0.01 x 24 // 0.24 dm3 | 1  1  1 | 3 |
|  |  | (ii) | Average rate of reaction = 0.667 cm3s\_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 | |

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| --- | --- | --- | --- | --- | --- | --- |
| 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) | C2HsOH + 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) | X  1  x—0—I  f/\] | H H H H  1 1 1 1 -C-—C—c—c—H  ‘Mil  H H H H | 1+1 |  |
|  |  | (iii) | Compound 2: Buthyl ethanoate/ Butil etanoat | |  |  |
|  |  |  | TOTAL | | 11 | |

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| 7 | (a) |  |  | |  | |  |  |
|  |  |  |  | Glacial ethanoic acid Asid etanoik glasial | Ethanoic acid + water Asid etanoik + air |  |  |  |
|  |  |  |  | Molecules  Molekul-molekul | Molecules and ions/ ion Molekul-molekul dan ion-ion /ion |  | 1+1 |  |
|  |  |  |  | Not show the property of acid  Tidak menunjukkan sifat asid | Show the property of acid Menunjukkan sifat asid |  | 1  1 |  |
|  |  |  |  | Hydrogen ions do not exist Ion hidrogen tidak wujud | Hydrogen ions exist Ion hidrogen wujud |  | ...4 |
|  | (b) |  | 2NaOH + H2S04 Na2S04 + 2H2Q | | | | 1+1 |  |
|  |  |  | 25 \* 0.1 \*= 1 Mb x 25 2 | |  | | 1+1 |  |
|  |  |  | Mb = 0.2 mol dm'3 | |  | | 1 | ...5 |
|  | (c) | (!) | 1. P = Ethanoic acid / Asid etanoik 2. Q = Hydrochloric acid / asid hidroklorik | | | | 1  1 |  |
|  |  |  |  | P | Q |  |  |  |
|  |  |  |  | Weak acid H asid lemah // ionised partially in water tl mengion separa dalam air | Strong acid H asid kuat it ionised completely in water //mengion lengkap dalam air |  | 1 |  |
|  |  |  |  | Produce lower concentration of H+ ions // kepekatan ion H\* rendah | higher concentration of H+ ions //  kepekatan ion hi\* tinggi |  | 1 |  |
|  |  |  |  | concentration of H+ higher pH value lower kepekatan ion hi\* tinggi nilai pH rendah | |  | 1 |  |
|  |  |  |  | |  | | ...5 |
|  |  | (!') | Hydrogen // hidrogen | |  | | 1 |  |
|  |  |  | Collect the gas into the test tube  Place the lighted wooden splinter in the mouth of the test tube Produce pop sound | | | | 1  1  1 |  |
|  |  |  | Kumpul gas ke dalam tabung uji.  Masukkan kayu uji menyata ke dalam mulut tabung uji. Bunyi pop terhasil. | | | |  |  |
|  |  |  | 2HCI + Mg MgCI2 + H2 [Balance chemical equation]  [Correct formula of reactant and product] | | | | 1  1 | ...6 |
|  |  |  | TOTAL | | | | 20 | |

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| 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//AI | 1  1 2 |
|  |  | (ii) | Set 1  ion Fe2+ are produced  -Iron is more electropositive than P// iron loses electron to formed Fe2+  . Fe > Fe2\* + 2e  - Iron is oxidised | 1  1  1 |
|  |  |  | Set 2  -OH‘ ion is present.   * Fe is less electropositive than Q // Q loses electron to formed ion Q * Q - > Q2+ + 2e * Q is oxidised | 1  1  1  1  1....8 |
|  |  |  | Set 1  ion Fe2+ terbentuk  -Fe iebih elektropositif berbanding P// Fe kebilangan electron membentuk ion Fe2\*  - Fe > Fe 2+ + 2e  -Fe dioksidakan |
|  |  |  | Set 2  Ion OH hadir.  -Fe kurang elektropositif berbanding Q, maka Q kehilangan electron membentuk ion Q  - Q > Q2+ + 2e  -Q dioksidakan. |  |

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|  |  |  | TOTAL | 20 |

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| 9 | (a) |  | Sample answer 11 Conloh iawaoan  NaCI/ Sodium chloride// natrium klorida 2Ch -+CI2 + 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 | 1 |  |
|  |  |  | Y : Copper 11 kuprum | 1 |  |
|  |  |  | Z: Silver // argentum | 1 |  |
|  |  |  | Set 1: Reaction occurred because X / zinc more | 1 |  |
|  |  |  | electropositive than Y /copper// |  |  |
|  |  |  | Tindak balas bertaku kerana X / zink lebih |  |  |
|  |  |  | elektropositif daripada Y / kuprum |  |  |
|  |  |  | Set II: Reaction occurred because Y / copper more | 1 |  |
|  |  |  | electropositive than Z /silver// |  |  |
|  |  |  | Tindak balas berlaku kerana Y / copper lebih |  |  |
|  |  |  | elektropositif daripada Z / argentum |  |  |
|  |  |  | Set III: Reaction does not occurred because Z less | 1 |  |
|  |  |  | electropositive than X// |  |  |
|  |  |  | Tindak balas tidak berlaku kerana Z kurang |  | ...6 |
|  |  |  | elektropositif daripada X |  |  |

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|  | (C) |  | Sample answer It Contoh iawaoan   1. Copper H kuprum 2. Materia! and apparatus I! bahan dan radas: Copper(ll)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   1. [ functional diagram // Rajah berfungsi ] 2. [ Labelled // dilabelI 3. Copper (II) sulphate solution is poured into a beaker // Larutan kuprum{\\) sulfat di tuang ke dalam sebuah bikar, 4. A pure 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.   1. Both plates are immersed in the solution // kedua-dua kepingan di celup dalam larutan 2. The circuit is completed //   Litar dilengkapkan // The switch is turned onH Suis dipasang   1. Anode// Anod : Cu -\* Cu2\* + 2e 2. Cathode // Katod : Cu2+ + 2e -\* Cu | 1  1  1  1  1  1  1  1  1  1 | ..10 |
|  |  |  | TOTAL | 20 | |

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| 10 | (a) |  | M = Zinc / Zink [ metal above Pb in ECS ] No of mol of Pb = 0.5 x 100 1000 = 0.05 | 1  1  1  1 |  |
|  |  |  | Heat produced = 0.05 x 112 x 1000 J mc0 = 5600 J 0 = 13.33 °C | ...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 Iebih 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 cm3 of 1.0 moldm'3 potassium hydroxide and pour into polystyrene cup.   1. Sukat 50cm3 larutan kalium hidroksida 1.0 moldm-3 dan dituang ke dalam cawan polisterin. 2. Measure 50 cm3 of 1.0 moldm-3 hydrocloric acid and pour into polystyrene cup.   2. Sukat 50 cm3 larutan asid hidroklorik 1.0 moldm 3 | 1  1 |  |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  |  | dan dituang ke dalam cawan polisterin.   1. Measure the initial temperature of the two solutions and recorded.   S.Sukat suhu aw a! bagi kedua-dua larutan dan direkod.   1. Pour the hydrochloric acid into the sodium hydroxide solution. 2. Tuang asid hidmklorik kedalam larutan kalium hidroksida 3. 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 | |