黎 sir 教室 A Lai Learning Center
HKDSE / IB Diploma / GCE AS AL / AP / SAT / HSC
IGCSE / GCSE / IB MYP / KS3 / MO / F.1 - F.6 / Y9 - Y13

2017 HKDSE Chemistry Paper 1A Suggested Solutions

Prepared by Andy Lai

HKDSE 5** Mathematics Teacher

100% M.C. Right !

HKDSE 5** Economics Teacher

HKDSE 5** Physics Teacher

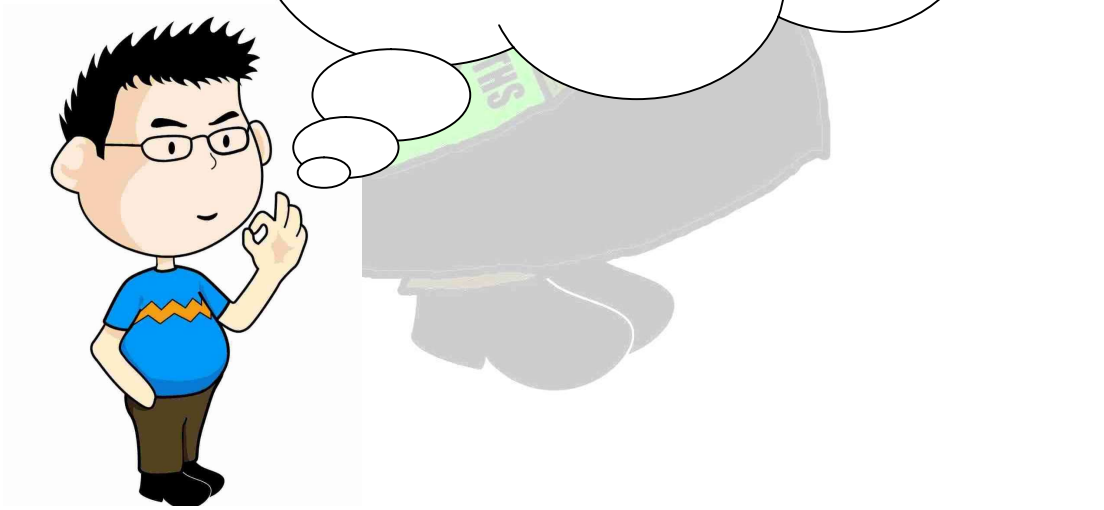
We deliver quality education.

We teach with hearts!

Enrollment Hotline: 6772 3001 Website: www.andylai.hk MSN: mrandylai@hotmail.com
Address: Rm706, Prosper Commercial Building, 9 Yin Chong Street, Mong Kok, Kowloon, Hong Kong.

2017 HKDSE Chemistry Paper 1A Suggested Answers

1.	C	2.	D	3.	A	4.	B	5.	D
6.	C	7.	A	8.	C	9.	A	10.	A
11.	B	12.	B	13.	D	14.	A	15.	B
16.	A	17.	A	18.	B	19.	D	20.	D
21.	C	22.	D	23.	B	24.	C	25.	B
26.	B	27.	C	28.	D	29.	A	30.	A
31.	B	32.	C	33.	C	34.	D	35.	C
36.	C								



Part I

1. C

黎 Sir 提提你 :

- Electronic configuration of potassium atom K: 2, 8, 8, 1 $\Rightarrow$ K^+: 2, 8, 8
- Electronic configuration of sulphide atom S: 2, 8, 6 $\Rightarrow$ S^{2-}: 2, 8, 8

2. D

黎 Sir 提提你 :

- Dilute HCl and H_2SO_4 is mineral acid.
- $HCl_{(aq)}$ is strong acid so it will completely ionize in water.
- $HCl_{(aq)}$ ionizes in water to give out hydrgon ions as the only cation.
- $HCl_{(aq)} \Rightarrow HCl + H_2O \Rightarrow H^+_{(aq)} + Cl^-_{(aq)} + H^+_{(aq)} + OH^-_{(aq)}$

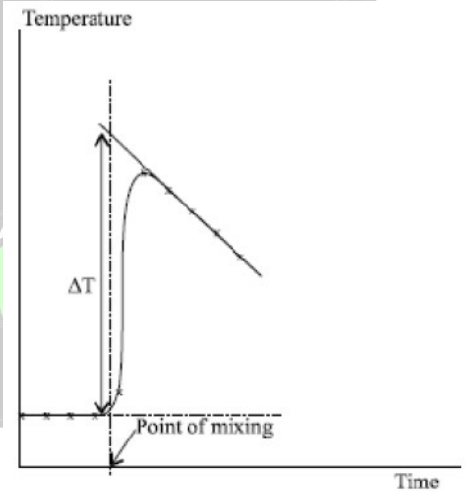
3. A

黎 Sir 提提你 :

- No. of moles of carbon in the hydrocarbon = $17.6 \times \frac{12}{12+16\times 2} \div 12 = 0.4\ mol$
- No. of moles of hydrogen in the hydrocarbon = $3.6 \times \frac{2}{1+1+16} \div 1 = 0.4\ mol$
- The simplest integer mole ratio of C to H = 0.4 : 0.4 = 1: 1
- Therefore, the empirical formula of the hydrocarbon is CH.

4.	**B**	**黎 Sir 提提你 :** ● **Electrochemical series of metal: Mg > H > Ag** ● **Magnesium anode: $Mg \rightarrow Mg^{2+} + 2\bar{e}$ ⇒ Mass of magnesium strip ↓** ● **Silver cathode: $Ag^{+} + \bar{e} \rightarrow Ag$ ⇒ Sliver ions migrate to the silver strip !** ● **Energy conversion: Chemical ⇒ Electrical ⇒ Light energy !** ● **Hydrogen ions will not be discharged since sliver ions is more preferentially discharged than hydrogen ions.** ● **Remarks: There are some small holes on the porous pot allowing the ions to pass through the wall slowly but prevent mixing up of the two electrolytes. Magnesium ions migrate out of the pot while nitrate ions migrate into to pot.**

5.	**D**	**黎 Sir 提提你 :** ● **C=C x 2 (1st and 3rd carbon) is the principle functional group ⇒ 1, 3-diene** ● **Longest backbone with principle functional group = 5 carbon ⇒ penta-** ● **Chlorine x 2 attached to the 5th carbon ⇒ 5,5,-dichloro** ● **Therefore, the systematic name is 5,5-dichloropenta-1,3-diene** ● **Remarks: Halogeno groups would never be used as the principal functional group.**

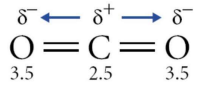
6.	C	黎 Sir 提提你 : ● This is a question about preparation of salts! ● $MgSO_{4(s)}$ is a soluble salts ⇒ Excess solid agents with Mg^{2+} ● Mg(s), MgO(s) and $MgCO_{3(s)}$ are excess solid agents with Mg^{2+} ⇒ OK ! ● $Mg(NO_3)_{2(s)}$ is soluble salts ⇒ No applicable to be used to prepare soluble. ● Remarks Preparation of salts is a hot topics in public exam but every year many students forgot about how to prepare the right reagents.
7.	A	黎 Sir 提提你 : ● Temperature of the content increases: Energy absorbed by content ● Extrapolation skiils: Compensation the energy loss ⇒ 79 – 28 = 41 °C  Extrapolation of temperature of the content in the reaction container with time

8.	**C**	**黎 Sir 提提你 :** ● **Nickel electrodes are both electrical conductors and catalyst for the reaction.** ● **At anode:** $H_{2(g)} + 2OH^-_{(aq)} \rightarrow 2H_2O_{(l)} + 2e$ **⇒ Water is formed !** ● $H_{2(g)}$ **is oxidized to ⇒** $H_{2(g)}$ **is a reducing agent !** ● **At cathode:** $O_{2(g)} + 2H_2O_{(l)} + 4e \rightarrow 4OH^-_{(aq)}$ **⇒** $O_{2(g)}$ **is passed to cathode !** ● **Overall equation:** $2H_{2(g)} + O_{2(g)} \rightarrow 2H_2O_{(l)}$
9.	**A**	**黎 Sir 提提你 :** ● $ZnO \rightarrow No\ \text{Re}action$ **!** ● $2CuO + C \rightarrow 2Cu + CO_2$ ● $LiCl_{(l)} \rightarrow Li_{(s)} + Cl_{2(g)}$ ● $Fe_2O_3 + 3CO \rightarrow 2Fe + 3CO_2$

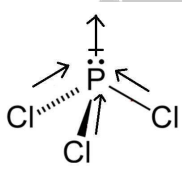
10.	**A**	**黎 Sir 提提你 :** ● $3CaCl_{2(aq)} + 2Na_3PO_{3(aq)} \rightarrow 6NaCl_{(aq)} + Ca_3(PO_3)_{2(s)}$ ● **Number of moles of** $CaCl_{2(aq)}$ **= 0.3(100/1000) = 0.03** ● **Number of moles of** $Na_3PO_{3(aq)}$ $\Rightarrow$ **= 0.1(300/1000) = 0.03** ● **By mole ratio,** $\frac{3}{2} = \frac{0.03}{x}$ $\Rightarrow$ **x = 0.02 < 0.03** $\Rightarrow$ $Na_3PO_{3(aq)}$ **is in excess** ● **Number of moles of** $Ca_3(PO_3)_{2(s)}$ **= 0.03 / 3 = 0.01 mole**
11.	**B**	**黎 Sir 提提你 :** ● $Zn + HCl \rightarrow ZnCl_2 + H_2 \Rightarrow Zn \rightarrow Zn^{2+} + 2e^- \Rightarrow$ **Zinc is reducing agent !** ● $Zn + MgCl_2 \rightarrow No\ Reaction$ **(∵ Zinc is less reactive than Magnesium !)** ● **Zinc has no reaction with hot water and ammonia solution !**

12. **B**

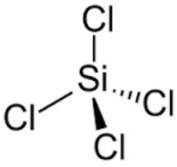
黎 Sir 提提你 :

- 

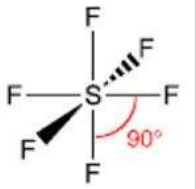
  ⇒ **Polar bonds and symmetric shape ⇒ Non-polar molecule !**

- 

  ⇒ **Polar bond but not cancel each other ⇒ Polar molecule !**

- 

  ⇒ **Polar bonds and symmetric shape ⇒ Non-polar molecule !**

- 

  ⇒ **Polar bonds and symmetric shape ⇒ Non-polar molecule !**

- **Remarks: Polar molecules will have a permanent dipole moment !**

- **Remarks: If you learn Physics (Mechanics: Force and motion, Vector sum: Tip-to-tail or parallelogram law!), you will have advantages! Actually, this part belongs to Physical Chemistry!**

13. D

黎 Sir 提提你 :

- **Rusting process involves flowing of charges, rusting would be faster in the presence of an electrolyte, for example, $NaNO_{3(aq)}$.**
- **If Iron is connected with copper, iron will undergoes sacrificial protection and loses electrons more readily than copper because E.C.S.: Iron > Copper.**
- **If the iron is connected to the positive terminal of the battery and copper is connected to the negative terminal of the battery, and $NaNO_{3(aq)}$ as the electrolyte, on Iron anode, there may be 3 possible reactions you can predict**

i. $4OH^- \rightarrow O_2 + H_2O + 4\bar{e}$ $\Rightarrow$ **Oxygen produced on the iron surface will enhance the rusting process:** $4Fe_{(s)} + 3O_{2(g)} + 2nH_2O_{(l)} \rightarrow 2Fe_2O_3 \bullet nH_2O_{(s)}$

ii. $Fe_{(s)} \rightarrow Fe_{(aq)} + 2\bar{e}$ **and** $Fe^{2+}{}_{(aq)} \rightarrow Fe^{3+}{}_{(aq)} + \bar{e}$ $\Rightarrow$ **Iron loses electrons itself readily and become iron(II) ions and then iron(III) ions.**

iii. $NO_3^- \rightarrow$ **No reaction occur no matter how concentrated the solution is !**

- **Referring to the electrochemical series, only reaction (ii) is possible !**
  (Do you know why?)
- **Therefore, in conclusion, Option D is the best answers!**
- **Remarks: We have to remember neither SO_4^{2-} nor NO_3^- will undergo oxidation in electrolysis no matter how concentrated the solution is.**
- **Remarks: In fact, the position of the electrochemical series is arranged according to "Standard reduction potential". However, the concept is out of existing syllabus, being a candidate have no choice only have to learn the position of the electrochemical series by rote.**

14.	**A**	**黎 Sir 提提你 :** ● **Oxygen support burning ⇒ relights a glowing splint !** ● **Oxygen is neutral ⇒ pH paper is green !** ● **Oxygen is not flammable ⇒ No pop sound with a burning splint !** ● **Remarks: Hydrogen is flammable and explosive and there is a pop sound with a burning splint. The pop sound can be regarded as a tiny scale of explosion !**

15.	**B**	**黎 Sir 提提你 :** ● **Balance the charges: -y = -z ⇒ y = z** ● **Balance no. of Cl atom: x + 4y = 12 + z ⇒ x + 4y = 12 + y ⇒ x = 12 -3y** ● **Balance no. of H atom: 6 + x = 12 ⇒ x = 6** ● **Therefore, y = (6 – 12)/(-3) = 2 ⇒ z = 2** ● **Remarks: Balance both the CHARGES and No. of atoms is a MUST to deal with this kind of question!**

16.	**A**	**黎 Sir 提提你 :** ● **Helium has fully-filled outermost electron shell ⇒ Inert !** ● **Helium gas is monatomic molecule ⇒ He only !** ● **The outermost shell of helium is 1st shell ⇒ Duplet structure !**

17. A

黎 Sir 提提你 :

- **Both $NaOH_{(aq)}$ and $NH_{3(aq)}$ react with $MgCl_{2(aq)}$ ⇒ Precipitation reaction !**

$$\begin{cases} 2NaOH_{(aq)} + MgCl_{2(aq)} \rightarrow 2NaCl_{(aq)} + Mg(OH)_{2(s)} \\ 2NH_{3(g)} + 2H_2O_{(l)} + MgCl_{2(aq)} \rightarrow 2NH_4Cl_{(aq)} + Mg(OH)_{2(s)} \end{cases}$$ **White ppt.**

- **Only Excess $NH_{3(aq)}$ react with $Cu(OH)_{2(aq)}$ to form deep blue solution**

Complex ions: $[Cu(NH_3)_4(H_2O)_2]^{2+}{}_{(aq)}$

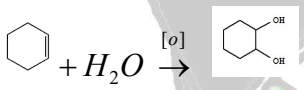
- **Both $NaOH_{(aq)}$ and $NH_{3(aq)}$ react with $CH_3COOH_{(aq)}$ ⇒ Neutralization !**

$$\begin{cases} NaOH_{(aq)} + CH_3COOH_{(aq)} \rightarrow CH_3COONa_{(aq)} + H_2O_{(l)} \\ NH_4^+{}_{(aq)} + OH^-{}_{(aq)} + CH_3COOH_{(aq)} \rightarrow CH_3COONH_{4(aq)} + H_2O_{(l)} \end{cases}$$

18. B

黎 Sir 提提你 :

- **A has a ring with no double bonds ⇒ Cycloalkanes**
- **B has a ring with a double bond ⇒ Cycloalkenes**
- **Only B can reacts with acidified $KMnO_{(aq)}$**



- **Mass of CO_2 α Moles of CO_2 α Moles of C in hydrocarbon to be burnt !**
- **Moles of C in compound A = 6 x (1/(12 x 6 + (1+1) x 6)) = 6 / 84 Mol**
- **Moles of C in compound B = 6 x (1/(12 x 6 + (1 + 1) x 4 + (1+1))) = 6/82 Mol**
- **Therefore, the mass of CO_2 is higher for complete combustion of 1.0 of B.**

19.	**D**	**黎 Sir 提提你 :** ● **Anhydrous Copper sulphate:** $CuSO_{4(s)}$ **⇒ White powders** ● **Hydrated Copper sulphate:** $CuSO_{4(s)} \bullet 5H_2O_{(s)}$ **⇒ Blue crystals** ● **Dissolving anhydrous Copper sulphate in water gives blue solutions** $CuSO_{4(s)} + 5H_2O_{(l)} \rightarrow CuSO_4 \bullet 5H_2O_{(aq)}$ ● **Heating hydrated copper(II) sulphate gives anhydrous copper sulphate powders.** $CuSO_4 \bullet 5H_2O_{(s)} \xrightarrow{Heat} CuSO_{4(s)} + 5H_2O_{(g)}$
20.	**D**	**黎 Sir 提提你 :** ● **For members in same homologous series ⇒ Same functional group !** ● **Functional group determine chemical properties.** ● **∴ Members in same homologous series have similar chemical properties.** ● **For successive members in same homologous series ⇒ Differ by $-CH_2$!** ● **∴ Members in same homologous series display gradation in physical properties.** ● **Same homologous series ⇒ Same general formula !**

21. **C**

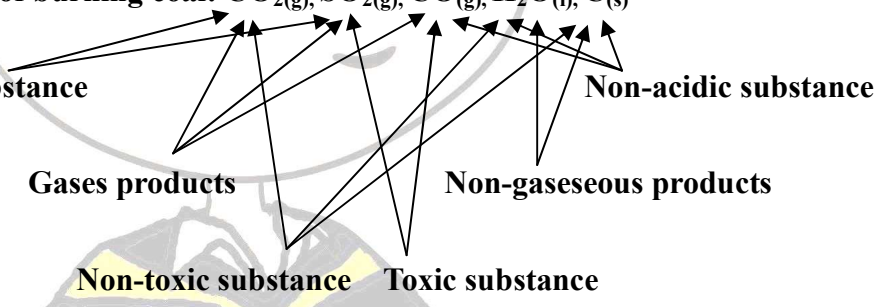
黎 Sir 提提你 :

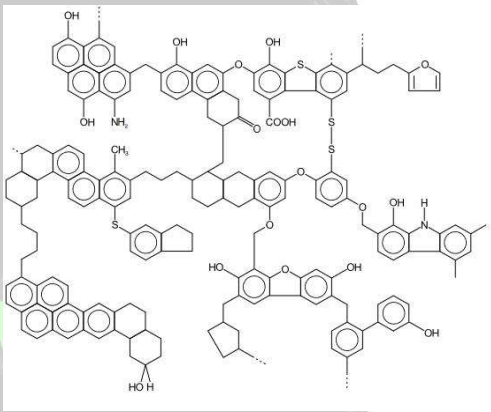
- Both $AgNO_{3(aq)}$ and $AgNO_{3(aq)}$ does not react with $Cu(NO_3)_{2(aq)}$
- Only $AgNO_{3(aq)}$ react with $HCl_{(aq)}$ to form $AgCl_{(s)}$ white ppt.
- Only $AgNO_{3(aq)}$ react with $KOH_{(aq)}$ to form $Ag(OH)_{2(s)}$ white ppt.

22. **D**

黎 Sir 提提你 :

- Coal is mainly composed of graphite, which is allotropy of carbon, together with hydrocarbons, and some other impurities like sulphur.
- Products of burning coal: $CO_{2(g)}$, $SO_{2(g)}$, $CO_{(g)}$, $H_2O_{(l)}$, $C_{(s)}$





Typical chemical structure of coal

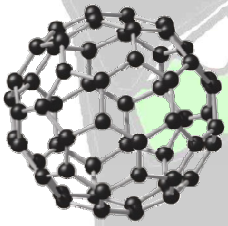
- Remarks: Coal is not the focus of fossil fuel part of the syllabus. However, in chemistry exam, the questions covered most parts of the syllabus, so if you want to get high grade, you have better revise all the topics thoroughly.

23.	**B**	**黎 Sir 提提你 :** ● **Concentrated nitric acid is a strong oxidizing agent where as Iodide ions is a reducing agent. ⇒ Redox reaction !** ● **Reduction:** $NO_3^-{}_{(aq)} + 2H^+{}_{(aq)} + \bar{e} \rightarrow NO_{2(g)} + H_2O_{(l)}$ ● **Oxidation:** $2I^-{}_{(aq)} \rightarrow I_{2(aq)} + 2\bar{e}$ ● **Overall equation:** $2NO_3^-{}_{(aq)} + 4H^+{}_{(aq)} + 2I^-{}_{(aq)} \rightarrow 2NO_{2(g)} + 2H_2O_{(l)} + I_{2(aq)}$ ● **Observation: Reddish brown gas is released and the solution turns brown.** ● **Remarks: This is a standard redox reaction question and students have to memorise the position of electrochemical series by rote to deal with this kind of question.**

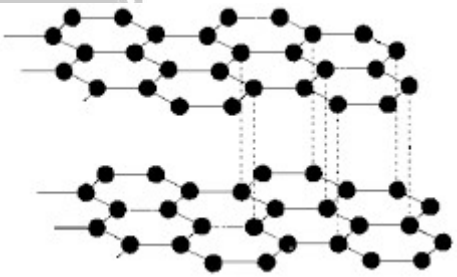
24. **C**

黎 Sir 提提你 :

- **Buckminsterfullerene (C_{60}) is simple molecules composed of 60 carbon atoms are linked by both single and double bonds and are arranged in pentagons and hexagons to form a hollow sphere.**
- **Each carbon atom is connected to three other carbon atoms by one double covalent bond and two single covalent bonds and arranged in a pattern of 20 hexagons and 12 pentagons on the surface of the sphere, similar to the pattern of Football surface.**
- **Therefore, there is neither mobile ions nor delocalized electrons to conduct electricity.**
- **Graphite is made up of carbon atoms forming 3 covalent bonds with other carbon atoms, which form a network of covalent bonds and a layer structure.**
- **The "spare" electron in each carbon become delocalised over the whole layer of atoms but they cannot jump from a layer to another.**
- **Therefore, graphite can conduct electricity across the same layer, but not between layers.**
- **Buckminsterfullerene (C_{60}) and Graphite are allotropes of carbons.**



Fullerenes (C_{60})



Graphite

25. **B**

黎 Sir 提提你 :

- **From sodium, magnesium and aluminium, they are giant metallic structure. The metallic bonds between the lattice ions and electrons sea is very strong. Therefore, their melting point is reasonably high but not extremely high when compared with group 4 (silicon) element.**

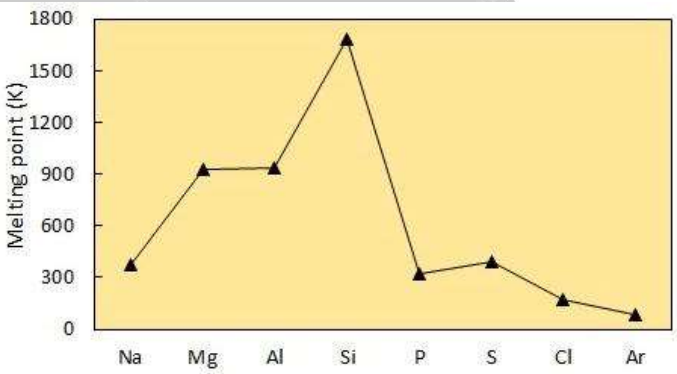
- **The strength of metallic bond depends on number of delocalized (outermost shell) electrons and thus the melting points increases from Group I to III as the number of outermost shell electrons increases from one to three.**

- **Group 4 element, silicon, exist as giant covalent lattice structure. Since strong covalent bonds must be broken to change from solid to liquid state, its melting points is extremely high compared with other elements in period 3.**

- **From group 5 to group 8 elements, they exist as discrete molecules, held together in simple molecular crystals by weak intermolecular van der Waals' forces. Therefore, the melting is extremely low compared with other elements in period 3.**

- **Sulphur molecules has the highest van der Waals' forces because it has the larger molecular mass (S_8) and larger contact surface area with neighbouring molecules.**

- **Similar argument applys in phosphorus (P_4), chlorine (Cl_4), and Argon (Ar), so the order of the melting points is $S_8 > P_4 > Cl_2 > Ar$.**

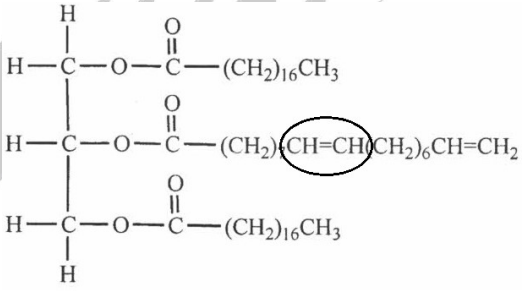


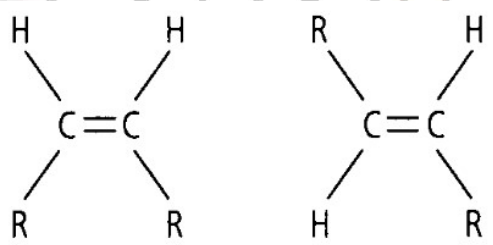
Melting points of different elements of period 3

26. **B**

黎 Sir 提提你 :

- **The cis-trans isomers of the compound depends on the 2 carbon atoms circled below:**





Cis (left) and trans (right) isomers

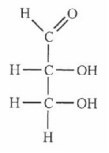
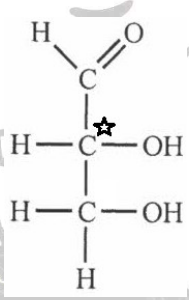
27. **C**

黎 Sir 提提你 :

- **Comparing trial 1 and trial 2**
  - ⇒ **$[A_{(aq)}]$ remains unchanged but $[B_{(aq)}]$ is doubled**
  - ⇒ **The time used is halved**
  - ⇒ **The rate is doubled when $[B_{(aq)}]$ is doubled.**
  - ⇒ **The rate of reaction depends on and increases with $[B_{(aq)}]$**

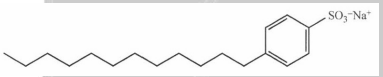
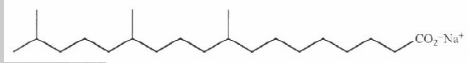
- **Comparing trial 1 and trial 3**
  - ⇒ **$[B_{(aq)}]$ remains unchanged but $[A_{(aq)}]$ is doubled**
  - ⇒ **The time used is the same**
  - ⇒ **The rate remains the same when $[A_{(aq)}]$ is doubled.**
  - ⇒ **The rate of reaction does not depend on $[A_{(aq)}]$**

28.	D	黎 Sir 提提你 : ● To make the cross become invisible when viewed above, there should be enough sulphur forms and the solution becomes opaque. ● Therefore, only the the rate of the following reaction with the formation of sulphur can be studies by the setup sated in the question 27. $Na_2S_2O_{3(aq)} + 2HCl_{(aq)} \rightarrow S_{(s)} + SO_{2_{(g)}} + H_2O_{(l)} + 2NaCl_{(aq)}$  **Sulphur is formed gradually and the whole cross is covered and cannot be seen from the above finally**

29.	A	黎 Sir 提提你 :  ● has two hydroxyl group (-OH) and One carbonyl center with the carbon atom also bonded to hydrogen and to an R group (-CHO). ● The Two hydroxyl group (-OH) can reacts with PCl_3 to form haloalkane. ● The Two hydroxyl group can forms hydrogen bonds with water molecules and so make the whole compound dissolve in water. ● There is a chiral carbon (marked with a star as shown below) and so it is an enantiomer ⇒ Optically active !  Chiral carbon marked with star ● Remarks: Optically active means it can rotate the plane of polarization of a plane polarised light.

30.	**A**	**黎 Sir 提提你 :** ● **Silicon dioxide is a giant covalent structure.** ● **Each silicon atom forms single covalent bond with 4 oxygen atoms and each oxygen atom forms single covalent bond with 2 silicon atoms.** ● **There is neither delocalized electron nor mobile ion to conduct electricity in silicon dioxide.** ● **Silicon dioxide reacts with alkaline solution slowly to form silicate ions.** $SiO_{2(s)} + 2OH^- \rightarrow SiO_3^{2-}{}_{(aq)} + H_2O_{(l)}$

31.	**B**	**黎 Sir 提提你 :** ● $W_{(l)} + X_{(l)} \Leftrightarrow Y_{(l)} + Z_{(l)}$, $\Delta H = +45\, kJ\, mol^{-1}$ ● $Kc = \dfrac{[Y][Z]}{[W][X]} \Rightarrow 2.5 = \dfrac{(\frac{x}{0.2})(\frac{x}{0.2})}{(\frac{1-X}{0.2})(\frac{1-X}{0.2})} \Rightarrow x = 0.61\, mol$

32.	C	黎 Sir 提提你 : ● $W_{(l)} + X_{(l)} \underset{\text{Exothermic}}{\overset{\text{Endothermic}}{\rightleftharpoons}} Y_{(l)} + Z_{(l)}, \quad \Delta H = +45\ kJ\ mol^{-1}$ ● **Removing $Z_{(l)}$ ⇒ Equilibrium shift to the right to counteract the changes !** **⇒ Number of moles of Y ↑** ● **↑ Volume of the container ⇒ Nothing to do with the equilibrium !** **(Unless reactants and products are in gaseous state !)** ● **↑ Temperature ⇒ Equilibrium shift to endothermic side to counteract it !** **⇒ Number of moles of Y ↑**
33.	C	黎 Sir 提提你 : ● **To form a stable emulsion when shaken with oil and water vigorously, the compound have to got a hydrophilic head (water loving) and a hydrophobic tail (water hating)!** ● **Both**  **and**  **have a hydrophilic head (SO_3^{2-} ea CO_2^-) and a long hydrophobic tail** **(Hydrocarbon chain), but not**  **.**

34. **D**

黎 Sir 提提你 :

- $2CrO_4^{2-}{}_{(aq)} + 2H^+{}_{(aq)} \Leftrightarrow Cr_2O_7^{2-}{}_{(aq)} + H_2O_{(l)}$
- **No matter the equilibrium is achieved or not, $[CrO_4^{2-}{}_{(aq)}]$ is not necessary equal to $[Cr_2O_7^{2-}{}_{(aq)}]$.**
- **When the reaction achieve equilibrium, neither forward reaction nor the backward reaction have stopped. Instead, both forward reaction and backward reaction continues to carry out but their rate are the same. This is so-called dynamic equilibrium.**
- **No matter the equilibrium is achieved or not, number of moles of $CrO_4^{2-}{}_{(aq)}$ is not necessary equal to number of moles of $Cr_2O_7^{2-}{}_{(aq)}$.**

35. **C**

黎 Sir 提提你 :

- **Ethanoic acid** $\xrightarrow[H_2O,\,Heat]{NaBH_4}$ **No reaction !**
- **Bromoethane** $\xrightarrow[\Delta]{NaOH}$ **Ethanol + Bromide ions**
- **Ethyl butanoate** $\xrightarrow[\Delta\,reflux]{NaOH}$ **Ethanol + Butanoate ions**
- **Remarks: Candidates should have remember that Carboxylic acid cannot be reduced by $NaBH_4$ with water as solvent , only Aldehyde and Ketone can be reduced by $NaBH_4$ to primary alcohols and secondary alcohol respectively.**
- **Remarks: Carboxylic acid can only be reduced by $LiAlH_4$ with dry ether as solvent and then is acidified to obtain primary alcohols.**

36.	**C**	**黎 Sir 提提你 :** ● $CH_3(CH_2)_3OH$ **is a primary alcohol** $\Rightarrow$ **reacts with** $KMnO_4 / H^+$ $CH_3(CH_2)_3OH \xrightarrow{KMnO_4/H^+} CH_3(CH_2)_2CHO \xrightarrow{KMnO_4/H^+} CH_3(CH_2)_2COOH$ **Butan-1-ol** **Butan-1-al** **Butanoic acid** ● $(CH_3)_3COH$ **is a tertiary alcohol** $\Rightarrow$ **No reaction with** $KMnO_4 / H^+$ ● **Both** $CH_3(CH_2)_3OH$ **and** $(CH_3)_3COH$ **are alcohol** $\Rightarrow$ **Same –OH group !**

The end.

黎 Sir 簡介 Andy Lai BEng CUHK, MIEEE

Mathematics
Economics
Physics

- ✧ 畢業於香港中文大學電子工程學系，黎 Sir 教室創辦人之一.
- ✧ 超過 15 年教授中學文憑 / IB Diploma / GCE / HSC / SAT / AP / GCSE / IGCSE / IB MYP 課程經驗.
- ✧ 與學生面對新中學文憑試,黎 Sir 親身上陣,以實力於數學科,物理科和經濟科奪取 5**,證明寶刀未老.
- ✧ 熟悉出題趨勢，教授考試取分技巧；鼓勵同學獨立思考，增強同學理解能力.
- ✧ 善用生活化例子講解，教法生動，增加學習趣味；深入淺出，明白學生學習上的困難和需要.
- ✧ 精心編制筆記，適合中文和英文中學學生就讀；精心編制練習和試題，協助同學盡快掌握答題技巧.
- ✧ 黎 Sir 在中學和大學時代已是一名傑出學生，曾獲取的多項學業上和運動上的獎學金及獎項.
- ✧ 曾代表香港參加國際性運動比賽，取得優異成績，又讀得又玩得，絕不是死讀書的書呆子.
- ✧ 任教科目：所有數學科，物理科，化學科，生物科，經濟科，商業科.

黎 Sir 教室學生佳績：

Excellent Results

- ✧ 首屆香港中學文憑 (HKDSE)，多位學生取得 5/5*/5**級以上佳績. 更有學生考獲 5 科 5**級 2 科 5*級 1 科 5 級優異成績，在全港 72620 考生中，排名 28，入讀港大醫學院.
- ✧ 英國高考 (GCE AS/AL)，多位學生取得 A*/A 最高級別，更有學生考獲 5 科 A*.
- ✧ 國際文憑 (IB Diploma)，多位學生取得 6 / 7 級別，更有學生取得 44/45 總分.
- ✧ 英國會考 (IGCSE / GCSE)，多位學生取得 A / A*成績，更有學生取得 8 科 A*。
- ✧ 加拿大大學預科 (CESI) 數學課程 MCV4U，取得 98 / 100, 99 / 100 成績。
- ✧ 學生成功拔尖 (EAS)，提早入讀港大理學院和中大法律學院.
- ✧ 香港中學會考 (HKCEE)，多位學生取得 20 分以上佳績.
- ✧ 保加利亞國際數學競賽 (BIMC 2013) 隊際賽金牌.
- ✧ 奧數華夏杯/港澳杯/華杯，多位學生取得特等獎/金獎/一等獎/全港第二名.
- ✧ 還有更多，怒不能盡錄，詳情請瀏覽以下網址: www.andylai.hk/result.htm

黎 Sir 教室課程特色：

- ✧ 小組教學 (1 – 6 人)，導師親身教學；照顧每位學生需要，事半功倍.
- ✧ 精心編制筆記，練習以近 30 年本地和外國公開試題為藍本.
- ✧ 概念理解，取分技巧並重；協助同學盡快掌握答題技巧.
- ✧ 歡迎自由組合小組上課，時間及課程內容編排更有彈性.
- ✧ 詳情請瀏覽以下網址: www.andylai.hk

黎 Sir 教室 A Lai Learning Center

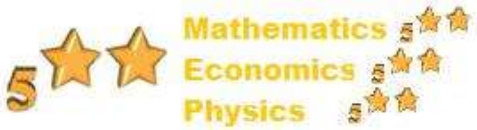
HKDSE / IB Diploma / GCE AS AL / AP / SAT / HSC

IGCSE / GCSE / IB MYP / KS3 / MO / F.1 – F.6 / Y9 – Y13

資深中學補習導師 小組補習 事半功倍!!!

黎 Sir 簡介 Andy Lai

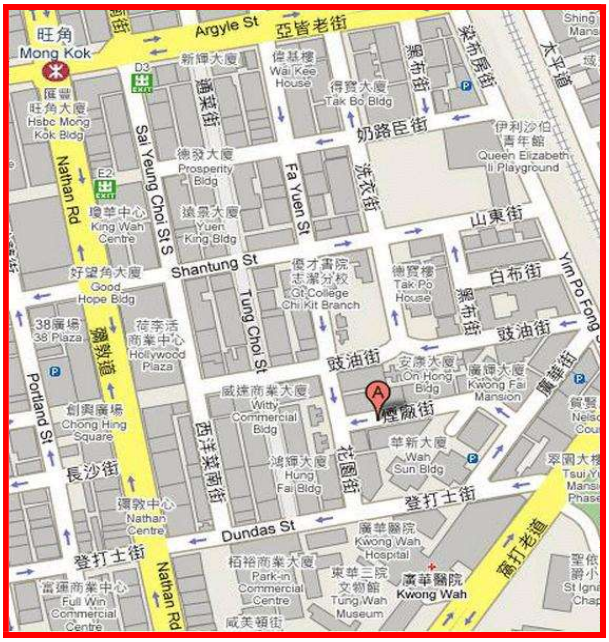
BEng CUHK, MIEEE



- ✧ 畢業於香港中文大學, 黎 Sir 教室創辦人之一.
- ✧ 超過 16 年教授 中學文憑 / IB Diploma / GCE / HSC / SAT / AP / GCSE / IGCSE / IB MYP 課程經驗.
- ✧ 與學生面對新中學文憑試,黎 Sir 親身上陣,於數學科,物理科和經濟科奪取 5**,證明寶刀未老.
- ✧ 現於黎 Sir 教室任教補習班, 學生就讀於英文中學, 中文中學, 國際學校及英國留學生.
- ✧ 熟悉近年出題趨勢, 教授考試取分技巧; 鼓勵同學獨立思考, 增強同學理解能力.
- ✧ 善用生活化例子講解, 教法生動, 增加學習趣味; 深入淺出, 明白學生學習上的困難和需要.
- ✧ 中英對照筆記,適合中文和英文中學學生就讀; 精心編制練習和試題,協助同學盡快掌握答題技巧.
- ✧ 黎 Sir 在中學和大學時代已是一名傑出學生, 曾獲取多項學業上和運動上的獎學金及獎項; 曾代表香港參加國際性運動比賽, 取得優異成績, 「又讀得又玩得」, 絕不是死讀書的書呆子.
- ✧ 黎 Sir 在就讀大學時曾於全球最大美資電腦公司任實習生超過一年, 大學畢業後旋即於全港大型英資電腦公司, 負責主理該公司所代理的全球大型美資電腦公司儲存系統銷售業務.
- ✧ 於短短半年內將該產品線銷售業績提升超過 50%. 同時更被公司評選為"傑出表現員工 Outstanding Performer", 成功將書本上的知識靈活運用於工作上.
- ✧ 黎 Sir 為了教學理想, 毅然辭去工作, 全身投入教學事業, 希望將自己的一套學習方法教授學生.

黎 Sir 教室 課程特色

- ✧ 小組教學 (1 – 6 人), 導師親身教學; 照顧每位學生需要, 事半功倍.
- ✧ 精心編制筆記, 練習以近 30 年本地和外國公開試題為藍本.
- ✧ 概念理解, 取分技巧並重; 協助同學盡快掌握答題技巧.
- ✧ 歡迎自由組合小組上課, 時間及課程內容編排更有彈性.
- ✧ 時間及課程請瀏覽以下網址: www.andylai.hk



地鐵:	旺角 E2 出口, 油麻地 A2 出口
小巴:	1, 1A, 2, 3C, 6, 6C, 6F, 9, 30X, 35A, 41A, 42A, 60X, 63X, 68X, 69X, 81S, 87D, 93K, 95, 104, 117, 203, 212, 230X, 234P, 234X, 238P, 238S, 259B, 270P, 281A
小巴:	21K, 74, 74S

黎Sir教室 A Lai Learning Center

上課地址:	香港九龍旺角煙廠街 9 號興發商業大廈 706 室.
查詢熱線:	6772 3001
電郵地址:	enquiry@andylai.hk
網址:	www.andylai.hk