

CHEMISTRY

UNIT 2(IAL)
2020 — 2025

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ANSWERS

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1 - (WCH11/2(IAL)_Summer_2020_Q1) - Energetics, Group Chemistry, Halogenoalkanes And Alcohols

The bond enthalpy for the Cl—Cl bond is $+243.0 \text{ kJ mol}^{-1}$.

What is the enthalpy change of atomisation of chlorine in kJ mol^{-1} ?

- A +243.0
- B -243.0
- C +121.5
- D -121.5

2 - (WCH11/2(IAL)_Summer_2020_Q2) - Energetics, Group Chemistry, Halogenoalkanes And Alcohols

The standard enthalpy change of neutralisation for the reaction between sodium hydroxide solution and hydrochloric acid is -56 kJ mol^{-1} .

Which row in the table is correct for this neutralisation?

	Reaction type	Temperature
<input type="checkbox"/> A	exothermic	increases
<input type="checkbox"/> B	exothermic	decreases
<input type="checkbox"/> C	endothermic	increases
<input type="checkbox"/> D	endothermic	decreases

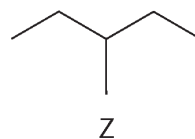
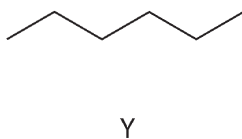
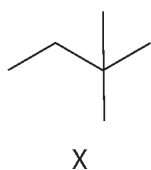
3 - (WCH11/2(IAL)_Summer_2020_Q3) - Energetics, Group Chemistry, Halogenoalkanes And Alcohols

Which of the following statements about water is **not** due to hydrogen bonding?

- A water has a less open structure than ice
- B ice cubes float in a glass of iced water
- C when water freezes its volume increases
- D water is a good solvent for ionic compounds

4 - (WCH11/2(IAL)_Summer_2020_Q4) - Energetics, Group Chemistry, Halogenoalkanes And Alcohols

The skeletal formulae of three isomers are shown.

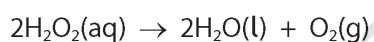


Which series shows the correct order of **increasing** boiling temperatures?

- A Y, X, Z
- B X, Y, Z
- C Y, Z, X
- D X, Z, Y

5 - (WCH11/2(IAL)_Summer_2020_Q5) - Energetics, Group Chemistry, Halogenoalkanes And Alcohols

Hydrogen peroxide decomposes in the presence of a catalyst.



(a) What type of reaction occurs?

(1)

- A displacement
- B disproportionation
- C elimination
- D hydrolysis

(b) In an experiment, the volume of oxygen produced by the decomposition of hydrogen peroxide was measured at various times as the reaction progressed and a graph was plotted.

The initial gradient of the graph was $0.50 \text{ cm}^3 \text{ s}^{-1}$.

What is the initial rate of decomposition of hydrogen peroxide in mol s^{-1} ?

[Molar volume of a gas at r.t.p. = $24 \text{ dm}^3 \text{ mol}^{-1}$]

(1)

- A $2.1 \times 10^{-2} \text{ mol s}^{-1}$
- B $4.2 \times 10^{-5} \text{ mol s}^{-1}$
- C $2.1 \times 10^{-5} \text{ mol s}^{-1}$
- D $1.0 \times 10^{-5} \text{ mol s}^{-1}$

6 - (WCH11/2(IAL)_Summer_2020_Q6) - Energetics, Group Chemistry, Halogenoalkanes And Alcohols

Dichromate(VI) ions may be reduced in acidic solution.



The coefficients in this half-equation are

	x	y	z
<input type="checkbox"/> A	14	6	7
<input type="checkbox"/> B	14	3	7
<input type="checkbox"/> C	7	6	3.5
<input type="checkbox"/> D	7	3	3.5

7 - (WCH11/2(IAL)_Summer_2020_Q7) - Energetics, Group Chemistry, Halogenoalkanes And Alcohols

In an oxide of potassium, the oxidation number of oxygen is $-\frac{1}{2}$.

What is the formula of this oxide?

- A K_2O
- B K_2O_2
- C K_2O_3
- D KO_2

ANSWERS

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1 - (WCH11/2(IAL)_Summer_2020_Q1) - Energetics, Group Chemistry, Halogenoalkanes And Alcohols

C

2 - (WCH11/2(IAL)_Summer_2020_Q2) - Energetics, Group Chemistry, Halogenoalkanes And Alcohols

A

3 - (WCH11/2(IAL)_Summer_2020_Q3) - Energetics, Group Chemistry, Halogenoalkanes And Alcohols

D

4 - (WCH11/2(IAL)_Summer_2020_Q4) - Energetics, Group Chemistry, Halogenoalkanes And Alcohols

D

5 - (WCH11/2(IAL)_Summer_2020_Q5) - Energetics, Group Chemistry, Halogenoalkanes And Alcohols

Question Number	Answer	Mark
(a)	The only correct answer is B (disproportionation) <i>A is incorrect because no species has been replaced/displaced</i> <i>C is incorrect because no species has been eliminated</i> <i>D is incorrect because water is produced and no species is hydrolysed</i>	(1)

Question Number	Answer	Mark
(b)	The only correct answer is B ($4.2 \times 10^{-5} \text{ mol s}^{-1}$) <i>A is incorrect because incorrect units for the Molar Volume of a gas has been used</i> <i>C is incorrect because the stoichiometry has not been taken into account</i> <i>D is incorrect because the stoichiometry is incorrect</i>	(1)

6 - (WCH11/2(IAL)_Summer_2020_Q6) - Energetics, Group Chemistry, Halogenoalkanes And Alcohols

A

7 - (WCH11/2(IAL)_Summer_2020_Q7) - Energetics, Group Chemistry, Halogenoalkanes And Alcohols

D