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CHEMISTRY

Course: OCR Chemistry A-Level

A-LEVEL SPECIFICATION

AS and A Level - Chemistry A - H032, H432 (from 2015) - OCR

FIVE TRANSITION RESOURCES

Five resources to support students moving from GCSE to A Level Chemistry (ocr.org.uk)

MATHEMATICAL SKILLS NEEDED TO STUDY A-LEVEL CHAMISTRY

The assessment of quantitative includes at least 20% Level 2 (or above) mathematical skills for chemistry. The following is counted as Level 2 (or higher) mathematics:

- Application and understanding requiring choice of data or equation to be used

- Problem solving involving use of mathematics from different areas of maths and decisions about direction to procced

- Questions involving use of A Level mathematical content e.g. use of logarithmic equations.

For more information and examples of mathematical skills used in A Level chemistry follow the link below:

Mathematical Skills Handbook - AS and A Level Chemistry A and Chemistry B (Salters) (ocr.org.uk)

TASK 1

DEFINITIONS & CHEMICAL FORMULAE

https://youtu.be/9yRBIJDBVmU?si=4tLZXrymdaP8Tasg

Watch the video using the link and then complete the task below.

The formulae of some positive and negative ions are shown in these tables

Name	Symbol	Charge	Name	Symbol	Charge
lithium	Li^+	1+	fluoride	F^-	1–
sodium	Na^+	1+	chloride	Cl^-	1–
potassium	K^+	1+	bromide	Br^-	1–
magnesium	Mg^{2+}	2+	iodide	I^-	1–
calcium	Ca^{2+}	2+	oxide	O^{2-}	2–
barium	Ba^{2+}	2+	sulfide	S^{2-}	2–
aluminium	Al^{3+}	3+	hydroxide	OH^-	1–
hydrogen	H^+	1+	silicate	SiO_3^{2-}	2–
ammonium	NH_4^+	1+	carbonate	CO_3^{2-}	2–
potassium	K^+	1+	hydrogencarbonate	HCO_3^-	1–
zinc	Zn^{2+}	2+	sulfate(VI)	SO_4^{2-}	2–
iron(II)	Fe^{2+}	2+	nitrate(V)	NO_3^-	1–
iron(III)	Fe^{3+}	3+	phosphate(V)	PO_4^{3-}	3–

What is the formula of each of the following compounds?

a sodium chloride

b lithium oxide

c zinc nitrate(V)

d ammonium carbonate

e potassium silicate

f potassium oxide

g aluminium oxide

h sodium phosphate(V)

i copper(II) fluoride

j copper(II) hydroxide

k iron(III) sulfate(VI)

l sodium bromide

m calcium carbonate

n ammonium phosphate

o calcium hydrogencarbonate

TASK 2 BALANCING EQUATIONS

https://youtu.be/X9fbhYV1zpc?si=JA_2kqvHKTfFanUi

Watch the video using the link and then complete the task below.

Balance each of the following equations:

(a) $Li(s) + O_2(g) \longrightarrow Li_2O(s)$

(b) $N_2(g) + H_2(g) \longrightarrow NH_3(g)$

(c) $Al(s) + H_2SO_4(aq) \longrightarrow Al_2(SO_4)_3(aq) + H_2(g)$

(d) $C_3H_8(g) + O_2(g) \longrightarrow CO_2(g) + H_2O(l)$

TASK 3 ATOMIC STRUCTURE

https://youtu.be/M4K4gr97VUw?si=q2YtnS55emwfFvOK

Watch the video using the link and then complete the task below.

Isotopes and relative atomic masses

1. The table below shows the isotopes of two elements, magnesium and neon. Copy and complete the table.

2. The relative atomic mass of an element is the weighted average atomic mass of the element relative to $\frac{1}{12}$ the mass of the ^{12}C isotope.

a) What does *weighted* mean in the definition?

Element	Isotopes		
Magnesium	$^{24}_{12}Mg$	$^{25}_{12}Mg$	$^{26}_{12}Mg$
Number of protons			
Number of electrons			
Number of neutrons			
Neon	$^{20}_{10}Ne$	$^{21}_{10}Ne$	$^{22}_{10}Ne$
Number of protons			
Number of electrons			
Number of neutrons			

b) Why use $\frac{1}{12}$ the mass of an atom of the ^{12}C isotope?

3. The relative atomic mass of chlorine is 35.5. What does this tell you about the relative abundance of the two naturally occurring isotopes of $^{35}_{17}Cl$ and $^{37}_{17}Cl$? Explain your answer.

4. The naturally occurring isotopes of magnesium and neon are shown in the table below, along with their relative abundance. Calculate the relative atomic mass for each element.

Element	Magnesium		
Atomic mass of isotope	24	25	26
Relative abundance %	78.60	10.11	11.29
	Neon		
Atomic mass of isotope	20	21	22
Relative abundance %	90.92	0.26	8.82

TASK 4 MOLES & AVOGADROS CONSTANT

https://youtu.be/wKoU2SHGlBM?si=s3RW1UCuEIYC695C

Watch the video using the link and then complete the task below.

Moles

1 What is the mass in grams of one mole of the following?
  a zinc atoms
  b lead atoms
  c hydrogen atoms
  d hydrogen molecules
  e sulfur atoms
  f sulfur molecules (S_8)
  g copper(II) nitrate(V) formula units
  h water molecules
  i sodium chloride formula units

2 a How many moles of atoms are there in the following?
      Give your answers to 3 significant figures.
      i   4.6 g of zinc
      ii   79 g of oxygen
      iii 0.156 g of calcium
      iv   109.6 g of sodium
      v   0.31 g of lead
      vi   5.3 g of hydrogen
  b Which of these samples contains the greatest number of atoms?
  c Which of these samples contains the smallest number of atoms?

3 How many moles of molecules are there in the following?
   Give your answers to 3 significant figures.
   a 9.0 g of water
   b 0.088 g of carbon dioxide
   c 56.3 g of carbon monoxide
   d 0.0465 g of ammonia

4 How many moles of formula units are there in the following?
   Give your answers to 3 significant figures.
   a 1.00 g of calcium carbonate
   b 26.0 g of copper(II) nitrate(V)
   c 74.63 g of zinc chloride
   d 0.163 g of aluminium oxide

ONLINE REVISION COURSES

https://senecalearning.com/en-US/

COURSES ASSIGNED BY TEACHERS

https://www.futurelearn.com/courses/collections/futurelearn-schools

QUERIES

Please email Ms Filipiak, Head of Chemistry

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