



Pearson

Pearson Edexcel Level 3
Advanced Subsidiary
GCE in Chemistry (8CH0)

Data Booklet

Issue 1
Summer 2016

P52910A

©2016 Pearson Education Ltd.

2/2/

Edexcel qualifications are awarded by Pearson, the UK's largest awarding body offering academic and vocational qualifications that are globally recognised and benchmarked. For further information, please visit our qualification websites at www.qualifications.pearson.com/en/home.html

Alternatively, you can get in touch with us using the details on our contact us page at www.qualifications.pearson.com/en/support/contact-us.html

About Pearson

Pearson is the world's leading learning company, with 40 000 employees in more than 70 countries working to help people of all ages to make measurable progress in their lives through learning. We put the learner at the centre of everything we do, because wherever learning flourishes, so do people. Find out more about how we can help you and your learners at: www.pearson.com/uk

This Data Booklet is available on our Chemistry 2015 webpage. Centres will be sent copies of the Data Booklet for the first examination series.

Centres can make additional fresh copies by printing the Data Booklet from our website. Candidates must use an unmarked copy of the Data Booklet in examinations.

Acknowledgement of source

The data used in the Data Booklet is derived from the *Nuffield Advanced Science, Revised Book of Data* (ISBN 058235448X), Nuffield Foundation.

All the material in this publication is copyright
© Pearson Education Limited 2016

Contents

Introduction	
Physical constants	1
Pauling electronegativities	1
Infrared spectroscopy	2
The Periodic Table of the Elements	3

Introduction

This Data Booklet is for use with the Pearson Edexcel Level 3 Advanced Subsidiary GCE in Chemistry (8CH0) assessments for papers 1 and 2.

Students will be provided with a clean copy of this Data Booklet for these assessments, which should be kept under the same conditions as the assessment papers.

Students may have a copy of this Data Booklet for their personal use in lessons and for homework, to allow them to become familiar with how to use it.

Physical constants

Avogadro constant (L)	$6.02 \times 10^{23} \text{ mol}^{-1}$
Elementary charge (e)	$1.60 \times 10^{-19} \text{ C}$
Gas constant (R)	$8.31 \text{ J mol}^{-1} \text{ K}^{-1}$
Molar volume of a gas at room temperature and pressure (r.t.p.):	$24 \text{ dm}^3 \text{ mol}^{-1}$

$$1 \text{ dm}^3 = 1000 \text{ cm}^3 = 0.001 \text{ m}^3$$

Pauling electronegativities

Pauling electronegativity index

							H										He
							2.1										
Li	Be											B	C	N	O	F	Ne
1.0	1.5											2.0	2.5	3.0	3.5	4.0	
Na	Mg											Al	Si	P	S	Cl	Ar
0.9	1.2											1.5	1.9	2.1	2.5	3.0	
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr
0.8	1.0	1.3	1.5	1.6	1.6	1.5	1.8	1.8	1.8	1.9	1.6	1.6	2.0	2.0	2.4	2.8	
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe
0.8	1.0	1.2	1.3	1.6	2.1	1.9	2.2	2.2	2.2	1.9	1.6	1.7	1.9	1.9	2.1	2.5	
Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn
0.7	0.9	1.1	1.3	1.5	2.3	1.9	2.2	2.2	2.2	2.5	2.0	1.6	1.8	1.9	2.0	2.2	

Infrared spectroscopy

Correlation of infrared absorption wavenumbers with molecular structure

Group	Wavenumber range/cm ⁻¹
C-H stretching vibrations	
Alkane	2962-2853
Alkene	3095-3010
Alkyne	3300
Arene	3030
Aldehyde	2900-2820 and 2775-2700
C-H bending variations	
Alkane	1485-1365
Arene 5 adjacent hydrogen atoms	750 and 700
4 adjacent hydrogen atoms	750
3 adjacent hydrogen atoms	780
2 adjacent hydrogen atoms	830
1 adjacent hydrogen atom	880
N-H stretching vibrations	
Amine	3500-3300
Amide	3500-3140
O-H stretching vibrations	
Alcohols and phenols	3750-3200
Carboxylic acids	3300-2500
C=C stretching vibrations	
Isolated alkene	1669-1645
Arene	1600, 1580, 1500, 1450
C=O stretching vibrations	
Aldehydes, saturated alkyl	1740-1720
Ketones alkyl	1720-1700
Ketones aryl	1700-1680
Carboxylic acids alkyl	1725-1700
aryl	1700-1680
Carboxylic acid anhydrides	1850-1800 and 1790-1740
Acyl halides chlorides	1795
bromides	1810
Esters, saturated	1750-1735
Amides	1700-1630
Triple bond stretching vibrations	
C≡N	2260-2215
C≡C	2260-2100

Pearson Education Limited. Registered in England and Wales No. 872828
Registered Office: Edinburgh Gate, Harlow, Essex CM20 2JE
VAT Reg No GB 278 537121