

# Chemistry Data Booklet

## Access 3 and Intermediate 1

For use in National Qualification Courses  
leading to the 2007 examinations and beyond.

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## PERIODIC TABLE OF THE MAIN ELEMENTS

<b>KEY:</b> Atomic Number Symbol Name of Element
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Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7	Column 0
1 <b>H</b> Hydrogen	4 <b>Be</b> Beryllium	5 <b>B</b> Boron	6 <b>C</b> Carbon	7 <b>N</b> Nitrogen	8 <b>O</b> Oxygen	9 <b>F</b> Fluorine	2 <b>He</b> Helium
3 <b>Li</b> Lithium	12 <b>Mg</b> Magnesium	13 <b>Al</b> Aluminium	14 <b>Si</b> Silicon	15 <b>P</b> Phosphorus	16 <b>S</b> Sulphur	17 <b>Cl</b> Chlorine	10 <b>Ne</b> Neon
11 <b>Na</b> Sodium	20 <b>Ca</b> Calcium	31 <b>Ga</b> Gallium	32 <b>Ge</b> Germanium	33 <b>As</b> Arsenic	34 <b>Se</b> Selenium	35 <b>Br</b> Bromine	18 <b>Ar</b> Argon
19 <b>K</b> Potassium	38 <b>Sr</b> Strontium	49 <b>In</b> Indium	50 <b>Sn</b> Tin	51 <b>Sb</b> Antimony	52 <b>Te</b> Tellurium	53 <b>I</b> Iodine	36 <b>Kr</b> Krypton
37 <b>Rb</b> Rubidium	56 <b>Ba</b> Barium	81 <b>Tl</b> Thallium	82 <b>Pb</b> Lead	83 <b>Bi</b> Bismuth	84 <b>Po</b> Polonium	85 <b>At</b> Astatine	54 <b>Xe</b> Xenon
55 <b>Cs</b> Caesium	88 <b>Ra</b> Radium						86 <b>Rn</b> Radon

Elements below the dark line are metals

## DATES OF DISCOVERY OF SELECTED ELEMENTS

<b>Name</b>	<b>Date of Discovery</b>
Aluminium	1827
Americium	1944
Calcium	1808
Carbon	Prehistoric
Chlorine	1774
Copper	Prehistoric
Curium	1944
Einsteinium	1953
Fermium	1955
Fluorine	1771
Gold	Prehistoric
Helium	1862
Hydrogen	1766
Iodine	1811
Iron	Prehistoric
Lead	Prehistoric
Magnesium	1775
Mendelevium	1957
Mercury	Prehistoric
Neon	1898
Nickel	1751
Nitrogen	1772
Nobelium	1961
Oxygen	1774
Platinum	16 <sup>th</sup> Century
Potassium	1807
Silicon	1823
Silver	Prehistoric
Sodium	1807
Strontium	1790
Sulphur	Prehistoric
Tin	Prehistoric
Titanium	1791
Uranium	1789

## MELTING POINTS, BOILING POINTS AND DENSITIES OF SELECTED ELEMENTS

<b>Name</b>	<b>Density in density units</b>	<b>Melting point in °C</b>	<b>Boiling point in °C</b>
Aluminium	2.70	660	2519
Bromine	3.12	-7	59
Calcium	1.55	842	1484
Chlorine	0.0032	-101	-34
Gold	19.3	1064	2856
Helium	0.0002	-272	-269
Iodine	4.93	114	184
Iron	7.87	1538	2861
Lithium	0.53	181	1347
Magnesium	1.74	650	1090
Mercury	13.5	-39	357
Nickel	8.90	1455	2913
Nitrogen	0.0013	-210	-196
Oxygen	0.0014	-219	-183
Potassium	0.86	64	759
Silicon	2.33	1414	3265
Silver	10.5	962	2212
Sodium	0.97	98	883
Sulphur	2.07	113	445
Tin	7.31	232	2602

## MELTING AND BOILING POINTS OF SELECTED IONIC COMPOUNDS

<b>Compound</b>	<b>Melting point in °C</b>	<b>Boiling point in °C</b>
sodium bromide	747	1390
magnesium chloride	714	1412
calcium oxide	2614	2850
lithium iodide	469	1171
potassium fluoride	858	1502

## MELTING AND BOILING POINTS OF SELECTED MOLECULAR COMPOUNDS

<b>Compound</b>	<b>Melting point in °C</b>	<b>Boiling point in °C</b>
water	0	100
methane	-182	-162
phenol	41	182
cyclohexane	7	81
naphthalene	80	218
ethene	-169	-104

## SOLUBILITIES OF SELECTED COMPOUNDS IN WATER

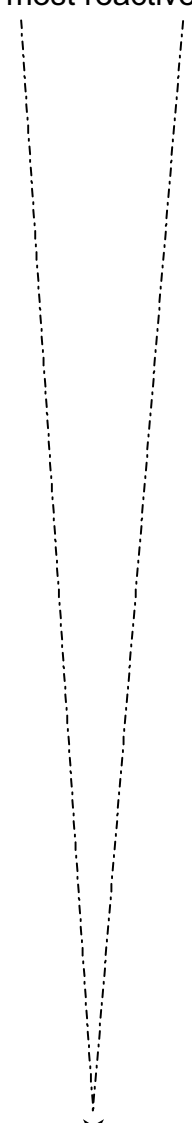
The table shows how some compounds behave in water:

	<b>carbonate</b>	<b>chloride</b>	<b>nitrate</b>	<b>phosphate</b>	<b>sulphate</b>
<b>calcium</b>	insoluble	very soluble	very soluble	insoluble	soluble
<b>copper</b>	insoluble	very soluble	very soluble	insoluble	very soluble
<b>iron</b>	insoluble	very soluble	very soluble	insoluble	very soluble
<b>magnesium</b>	insoluble	very soluble	very soluble	insoluble	very soluble
<b>potassium</b>	very soluble	very soluble	very soluble	very soluble	very soluble
<b>sodium</b>	very soluble	very soluble	very soluble	very soluble	very soluble

## USES AND PROPERTIES OF SELECTED METALS

METAL	USES	PROPERTIES
Aluminium	Overhead electrical cables, doors, windows, cans, aircraft bodies	Good electrical conductor, low density
Copper	Water pipes, electrical wiring	Corrosion resistant, good electrical conductor
Iron	Railway lines, machinery, nails, bridges	Strong, easily worked
Lead	Roofing, radiation protection	High density, soft
Mercury	Thermometers, dental amalgam	High density, liquid
Tin	Coating cans, making bronze	Corrosion resistant
Titanium	Spectacle frames, bone pins, jet engines	Corrosion resistant, strong, low density
Zinc	Coating iron objects, dry batteries	Corrosion resistant

## REACTIONS OF METALS

Metal	Reactivity	Reaction with		
		Oxygen	Water	Dilute acid
potassium	most reactive  least reactive	metals which react with oxygen	metals which react with water	metals which react with dilute acid
sodium				
lithium				
calcium				
magnesium				
aluminium				
zinc		no reaction	no reaction	no reaction
iron				
tin				
lead				
copper		no reaction	no reaction	no reaction
mercury				
silver				
gold				

## COMPOSITIONS OF SELECTED FOODS

The table shows the masses, in grams, of carbohydrate, fat and protein per 100 grams of food.

<b>Food</b>	<b>Carbohydrate</b>	<b>Fat</b>	<b>Protein</b>
Bananas	20	0	1
Bread	55	2	8
Butter	0	83	1
Cake	55	16	5
Carrots	6	0	1
Cheese	0	35	25
Eggs	0	12	12
Fish	0	1	16
Jam	69	0	1
Milk	5	4	3
Orange juice	12	0	1
Peanuts	9	49	28
Peas	11	0	6
Potatoes	20	0	1
Rice	87	1	6
Sausages	14	31	10
Spaghetti	84	1	10
Steak	0	16	17

# PERIODIC TABLE OF THE ELEMENTS

Column 1 2 3 4 5 6 7 0

1 Hydrogen <b>H</b>	2 Helium <b>He</b>							
3 Lithium <b>Li</b>	4 Beryllium <b>Be</b>	5 Boron <b>B</b>	6 Carbon <b>C</b>	7 Nitrogen <b>N</b>	8 Oxygen <b>O</b>	9 Fluorine <b>F</b>	10 Neon <b>Ne</b>	
11 Sodium <b>Na</b>	12 Magnesium <b>Mg</b>	13 Aluminium <b>Al</b>	14 Silicon <b>Si</b>	15 Phosphorus <b>P</b>	16 Sulphur <b>S</b>	17 Chlorine <b>Cl</b>	18 Argon <b>Ar</b>	
19 Potassium <b>K</b>	20 Calcium <b>Ca</b>	31 Gallium <b>Ga</b>	32 Germanium <b>Ge</b>	33 Arsenic <b>As</b>	34 Selenium <b>Se</b>	35 Bromine <b>Br</b>	36 Krypton <b>Kr</b>	
37 Rubidium <b>Rb</b>	38 Strontium <b>Sr</b>	49 Indium <b>In</b>	50 Tin <b>Sn</b>	51 Antimony <b>Sb</b>	52 Tellurium <b>Te</b>	53 Iodine <b>I</b>	54 Xenon <b>Xe</b>	
55 Caesium <b>Cs</b>	56 Barium <b>Ba</b>	81 Thallium <b>Tl</b>	82 Lead <b>Pb</b>	83 Bismuth <b>Bi</b>	84 Polonium <b>Po</b>	85 Astatine <b>At</b>	86 Radon <b>Rn</b>	

Atomic number	Name of element	Symbol
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### Key

1 Hydrogen <b>H</b>	2 Helium <b>He</b>
3 Lithium <b>Li</b>	4 Beryllium <b>Be</b>
11 Sodium <b>Na</b>	12 Magnesium <b>Mg</b>
19 Potassium <b>K</b>	20 Calcium <b>Ca</b>
37 Rubidium <b>Rb</b>	38 Strontium <b>Sr</b>
55 Caesium <b>Cs</b>	56 Barium <b>Ba</b>
87 Francium <b>Fr</b>	88 Radium <b>Ra</b>

### TRANSITION METALS

21 Scandium <b>Sc</b>	22 Titanium <b>Ti</b>	23 Vanadium <b>V</b>	24 Chromium <b>Cr</b>	25 Manganese <b>Mn</b>	26 Iron <b>Fe</b>	27 Cobalt <b>Co</b>	28 Nickel <b>Ni</b>	29 Copper <b>Cu</b>	30 Zinc <b>Zn</b>
39 Yttrium <b>Y</b>	40 Zirconium <b>Zr</b>	41 Niobium <b>Nb</b>	42 Molybdenum <b>Mo</b>	43 Technetium <b>Tc</b>	44 Ruthenium <b>Ru</b>	45 Rhodium <b>Rh</b>	46 Palladium <b>Pd</b>	47 Silver <b>Ag</b>	48 Cadmium <b>Cd</b>
57 Lanthanum <b>La</b>	72 Hafnium <b>Hf</b>	73 Tantalum <b>Ta</b>	74 Tungsten <b>W</b>	75 Rhenium <b>Re</b>	76 Osmium <b>Os</b>	77 Iridium <b>Ir</b>	78 Platinum <b>Pt</b>	79 Gold <b>Au</b>	80 Mercury <b>Hg</b>
58-71	104 Rutherfordium <b>Rf</b>	105 Dubnium <b>Db</b>	106 Seaborgium <b>Sg</b>	107 Bohrium <b>Bh</b>	108 Hassium <b>Hs</b>	109 Meitnerium <b>Mt</b>			
89 Actinium <b>Ac</b>									

58 Cerium <b>Ce</b>	59 Praseodymium <b>Pr</b>	60 Neodymium <b>Nd</b>	61 Promethium <b>Pm</b>	62 Samarium <b>Sm</b>	63 Europium <b>Eu</b>	64 Gadolinium <b>Gd</b>	65 Terbium <b>Tb</b>	66 Dysprosium <b>Dy</b>	67 Holmium <b>Ho</b>	68 Erbium <b>Er</b>	69 Thulium <b>Tm</b>	70 Ytterbium <b>Yb</b>	71 Lutetium <b>Lu</b>
90 Thorium <b>Th</b>	91 Protactinium <b>Pa</b>	92 Uranium <b>U</b>	93 Neptunium <b>Np</b>	94 Plutonium <b>Pu</b>	95 Americium <b>Am</b>	96 Curium <b>Cm</b>	97 Berkelium <b>Bk</b>	98 Californium <b>Cf</b>	99 Einsteinium <b>Es</b>	100 Fermium <b>Fm</b>	101 Mendelevium <b>Md</b>	102 Nobelium <b>No</b>	103 Lawrencium <b>Lr</b>



Elements below the dark line are metals.

