

A-level Chemistry



3.2 Inorganic Chemistry (Y12)

hydrogen 1 H 1.0079																	helium 2 He 4.0026																												
lithium 3 Li 6.941	beryllium 4 Be 9.0122																	boron 5 B 10.81	carbon 6 C 12.011	nitrogen 7 N 14.007	oxygen 8 O 15.999	fluorine 9 F 18.998	neon 10 Ne 20.180																						
sodium 11 Na 22.990	magnesium 12 Mg 24.305																	aluminum 13 Al 26.982	silicon 14 Si 28.086	phosphorus 15 P 30.974	sulfur 16 S 32.06	chlorine 17 Cl 35.45	argon 18 Ar 39.948																						
potassium 19 K 39.098	calcium 20 Ca 40.078	scandium 21 Sc 44.956	titanium 22 Ti 47.887	vanadium 23 V 50.942	chromium 24 Cr 51.996	manganese 25 Mn 54.938	iron 26 Fe 55.845	cobalt 27 Co 58.933	nickel 28 Ni 58.693	copper 29 Cu 63.546	zinc 30 Zn 65.38	gallium 31 Ga 69.723	germanium 32 Ge 72.61	arsenic 33 As 74.922	selecnium 34 Se 78.96	bromine 35 Br 79.904	krypton 36 Kr 83.80																												
rubidium 37 Rb 85.468	strontium 38 Sr 87.62	yttrium 39 Y 88.906	zirconium 40 Zr 91.224	niobium 41 Nb 92.906	molybdenum 42 Mo 95.94	technetium 43 Tc 98	ruthenium 44 Ru 101.07	rhodium 45 Rh 101.07	palladium 46 Pd 106.32	silver 47 Ag 107.87	cadmium 48 Cd 112.41	indium 49 In 114.82	tin 50 Sn 118.71	antimony 51 Sb 121.76	tellurium 52 Te 127.60	iodine 53 I 126.905	xenon 54 Xe 131.29																												
cesium 55 Cs 132.91	barium 56 Ba 137.33	* 57-70 Lu 174.967	hafnium 72 Hf 178.49	tantalum 73 Ta 180.948	tungsten 74 W 183.84	rhenium 75 Re 186.21	osmium 76 Os 190.23	iridium 77 Ir 192.22	platinum 78 Pt 195.08	gold 79 Au 196.967	mercury 80 Hg 200.59	thallium 81 Tl 204.38	lead 82 Pb 207.2	bismuth 83 Bi 208.98	polonium 84 Po 209	astatine 85 At 210	radon 86 Rn 222																												
francium 87 Fr 223	radium 88 Ra 226	* 89-102 Lr 261	rutherfordium 103 Rf 261	rhodium-104 104 Rf 261	rhodium-105 105 Db 262	rhodium-106 106 Sg 263	rhodium-107 107 Bh 264	rhodium-108 108 Hs 265	rhodium-109 109 Mt 266	rhodium-110 110 Uun 267	rhodium-111 111 Uuu 268	rhodium-112 112 Uub 269	rhodium-114 114 Uuq 271																																
<table border="1"> <tbody> <tr> <td>lanthanum 57 La 138.91</td> <td>cerium 58 Ce 140.12</td> <td>praseodymium 59 Pr 140.91</td> <td>neodymium 60 Nd 144.24</td> <td>promethium 61 Pm 145</td> <td>samarium 62 Sm 150.36</td> <td>europium 63 Eu 151.96</td> <td>gadolinium 64 Gd 157.25</td> <td>terbium 65 Tb 158.93</td> <td>dysprosium 66 Dy 162.50</td> <td>holmium 67 Ho 164.93</td> <td>erbium 68 Er 167.26</td> <td>thulium 69 Tm 168.93</td> <td>ytterbium 70 Yb 173.04</td> </tr> <tr> <td>actinium 89 Ac 227</td> <td>thorium 90 Th 232.04</td> <td>protactinium 91 Pa 231.04</td> <td>uranium 92 U 238.03</td> <td>neptunium 93 Np 237</td> <td>plutonium 94 Pu 244</td> <td>americium 95 Am 243</td> <td>curium 96 Cm 247</td> <td>berkelium 97 Bk 247</td> <td>californium 98 Cf 251</td> <td>einsteinium 99 Es 252</td> <td>fermium 100 Fm 257</td> <td>mendelevium 101 Md 258</td> <td>nobelium 102 No 259</td> </tr> </tbody> </table>																		lanthanum 57 La 138.91	cerium 58 Ce 140.12	praseodymium 59 Pr 140.91	neodymium 60 Nd 144.24	promethium 61 Pm 145	samarium 62 Sm 150.36	europium 63 Eu 151.96	gadolinium 64 Gd 157.25	terbium 65 Tb 158.93	dysprosium 66 Dy 162.50	holmium 67 Ho 164.93	erbium 68 Er 167.26	thulium 69 Tm 168.93	ytterbium 70 Yb 173.04	actinium 89 Ac 227	thorium 90 Th 232.04	protactinium 91 Pa 231.04	uranium 92 U 238.03	neptunium 93 Np 237	plutonium 94 Pu 244	americium 95 Am 243	curium 96 Cm 247	berkelium 97 Bk 247	californium 98 Cf 251	einsteinium 99 Es 252	fermium 100 Fm 257	mendelevium 101 Md 258	nobelium 102 No 259
lanthanum 57 La 138.91	cerium 58 Ce 140.12	praseodymium 59 Pr 140.91	neodymium 60 Nd 144.24	promethium 61 Pm 145	samarium 62 Sm 150.36	europium 63 Eu 151.96	gadolinium 64 Gd 157.25	terbium 65 Tb 158.93	dysprosium 66 Dy 162.50	holmium 67 Ho 164.93	erbium 68 Er 167.26	thulium 69 Tm 168.93	ytterbium 70 Yb 173.04																																
actinium 89 Ac 227	thorium 90 Th 232.04	protactinium 91 Pa 231.04	uranium 92 U 238.03	neptunium 93 Np 237	plutonium 94 Pu 244	americium 95 Am 243	curium 96 Cm 247	berkelium 97 Bk 247	californium 98 Cf 251	einsteinium 99 Es 252	fermium 100 Fm 257	mendelevium 101 Md 258	nobelium 102 No 259																																

Name

Lesson Date(s)	Topic	Learning Outcomes From Specification	Key Words & Equations	Notes (Revision tips, exam technique tips, priorities for revision etc.)
	3.2.1.1 Classification	An element is classified as s, p, d or f block according to its position in the Periodic Table, which is determined by its proton number.		
	3.2.1.2 Physical Properties of Period 3 Elements	<p>The trends in atomic radius, first ionisation energy and melting point of the elements Na–Ar</p> <p>The reasons for these trends in terms of the structure of and bonding in the elements.</p> <p>Students should be able to:</p> <ul style="list-style-type: none"> explain the trends in atomic radius and first ionisation energy explain the melting point of the elements in terms of their structure and bonding. 		

Lesson Date(s)	Topic	Learning Outcomes From Specification	Key Words & Equations	Notes (Revision tips, exam technique tips, priorities for revision etc.)
	3.2.2 Group, the Alkaline Earth Metals	<p>The trends in atomic radius, first ionisation energy and melting point of the elements Mg–Ba</p> <p>Students should be able to:</p> <ul style="list-style-type: none"> explain the trends in atomic radius and first ionisation energy explain the melting point of the elements in terms of their structure and bonding. <p>The reactions of the elements Mg–Ba with water.</p> <p>The use of magnesium in the extraction of titanium from TiCl_4</p> <p>The relative solubilities of the hydroxides of the elements Mg–Ba in water.</p> <p>$\text{Mg}(\text{OH})_2$ is sparingly soluble.</p> <p>The use of $\text{Mg}(\text{OH})_2$ in medicine and of $\text{Ca}(\text{OH})_2$ in agriculture.</p> <p>The use of CaO or CaCO_3 to remove SO_2 from flue gases.</p> <p>The relative solubilities of the sulfates of the elements Mg–Ba in water.</p> <p>BaSO_4 is insoluble.</p> <p>The use of acidified BaCl_2 solution to test for sulfate ions.</p> <p>The use of BaSO_4 in medicine.</p>		

Lesson Date(s)	Topic	Learning Outcomes From Specification	Key Words & Equations	Notes (Revision tips, exam technique tips, priorities for revision etc.)
		<p>Students should be able to:</p> <p>explain why BaCl_2 solution is used to test for sulfate ions and why it is acidified.</p>		
	<p>3.2.3.1</p> <p>Trends in Properties of Group 7(17), the Halogens</p>	<p>The trends in electronegativity and boiling point of the halogens.</p> <p>Students should be able to:</p> <ul style="list-style-type: none"> explain the trend in electronegativity explain the trend in the boiling point of the elements in terms of their structure and bonding. <p>The trend in oxidising ability of the halogens down the group, including displacement reactions of halide ions in aqueous solution.</p> <p>The trend in reducing ability of the halide ions, including the reactions of solid sodium halides with concentrated sulfuric acid.</p> <p>The use of acidified silver nitrate solution to identify and distinguish between halide ions.</p> <p>The trend in solubility of the silver halides in ammonia.</p> <p>Students should be able to explain why:</p> <ul style="list-style-type: none"> silver nitrate solution is used to identify halide ions the silver nitrate solution is acidified ammonia solution is added. 		

Lesson Date(s)	Topic	Learning Outcomes From Specification	Key Words & Equations	Notes (Revision tips, exam technique tips, priorities for revision etc.)
	3.2.3.2 Uses of Chlorine and Chlorate(I)	<p>The reaction of chlorine with water to form chloride ions and chlorate(I) ions.</p> <p>The reaction of chlorine with water to form chloride ions and oxygen.</p> <p>Appreciate that society assesses the advantages and disadvantages when deciding if chemicals should be added to water supplies.</p> <p>The use of chlorine in water treatment.</p> <p>Appreciate that the benefits to health of water treatment by chlorine outweigh its toxic effects.</p> <p>The reaction of chlorine with cold, dilute, aqueous NaOH and uses of the solution formed.</p> <p>Required practical 4</p> <p>Carry out simple test-tube reactions to identify:</p> <p>cations – Group 2, NH₄⁺</p> <p>anions – Group 7 (halide ions), OH⁻, CO₃²⁻, SO₄²⁻</p>		