



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS  
International General Certificate of Secondary Education

CANDIDATE  
NAME

CENTRE  
NUMBER

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CANDIDATE  
NUMBER

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**CHEMISTRY**

**0620/21**

Paper 2

**May/June 2012**

**1 hour 15 minutes**

Candidates answer on the Question Paper.

No Additional Materials are required.

**READ THESE INSTRUCTIONS FIRST**

Write your Centre number, candidate number and name in the spaces at the top of this page.

Write in dark blue or black pen.

You may need to use a pencil for any diagrams, graphs or rough working.

Do not use staples, paper clips, highlighters, glue or correction fluid.

**DO NOT WRITE IN ANY BARCODES.**

Answer **all** questions.

A copy of the Periodic Table is printed on page 16.

At the end of the examination, fasten all your work securely together.

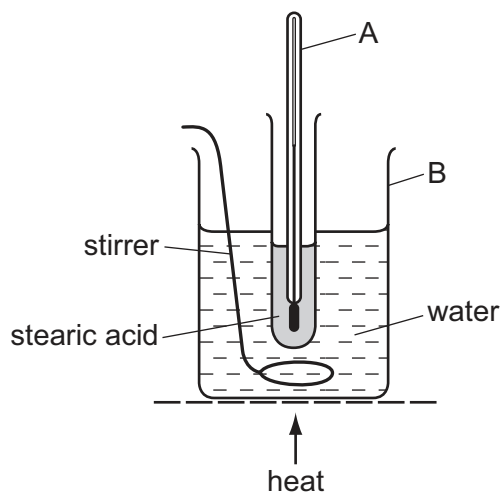
The number of marks is given in brackets [ ] at the end of each question or part question.

For Examiner's Use	
1	
2	
3	
4	
5	
6	
7	
<b>Total</b>	

This document consists of **15** printed pages and **1** blank page.



- 1 Stearic acid is a solid at room temperature.  
The diagram below shows the apparatus used for finding the melting point of stearic acid.  
The apparatus was heated at a steady rate and the temperature recorded every minute.



- (a) State the name of the piece of apparatus labelled

A, .....

B. .... [2]

- (b) (i) Suggest why the water needs to be kept stirred during this experiment.

.....

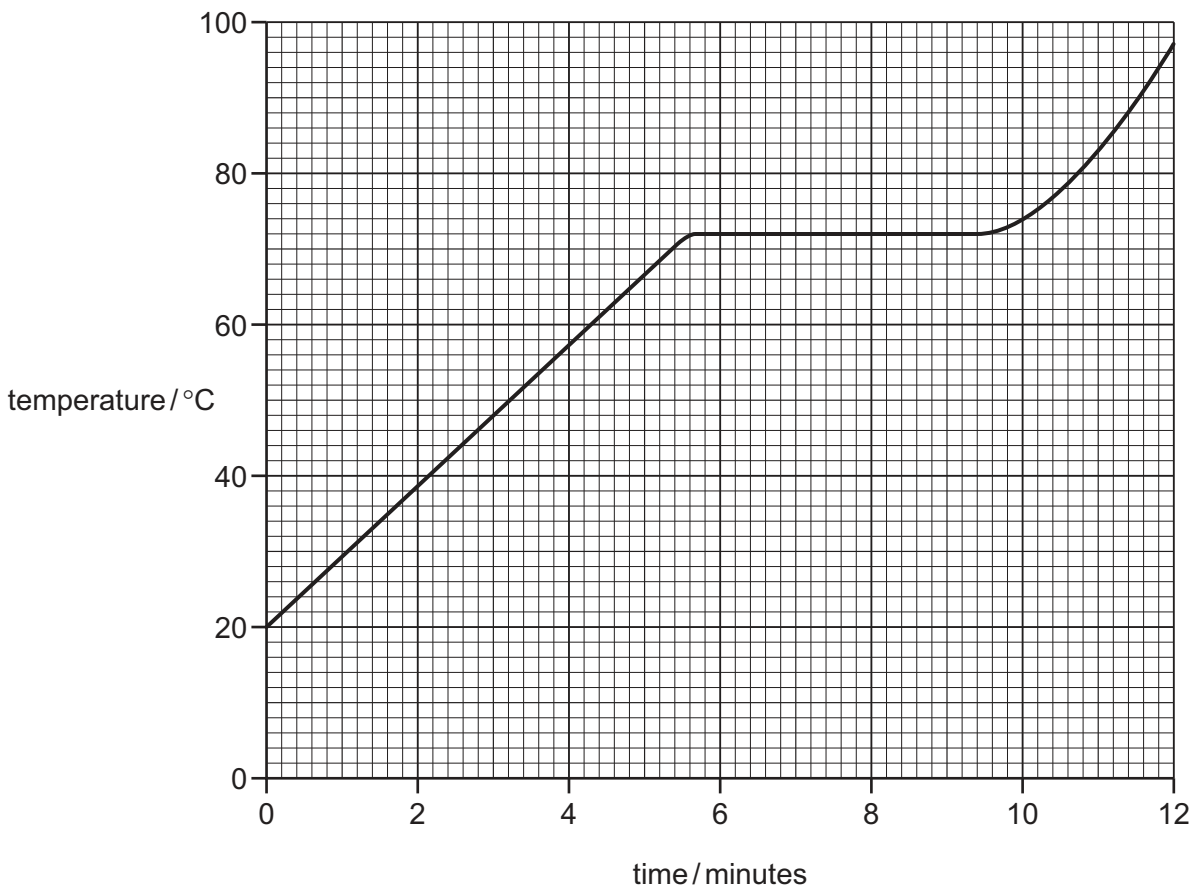
..... [1]

- (ii) Describe a chemical test for water.

test .....

result ..... [2]

(c) A graph of temperature of stearic acid against time of heating is shown below.



(i) What was the temperature of the stearic acid after 3 minutes heating?

..... [1]

(ii) Use the information on the graph to determine the melting point of stearic acid.

..... [1]

(d) Describe the arrangement and motion of the particles in liquid stearic acid.

arrangement .....

motion ..... [2]

(e) A sample of stearic acid contained 1% of another compound with a higher relative molecular mass.

(i) Which one of the following statements about this sample of stearic acid is correct?  
Tick **one** box.

Its density is exactly the same as that of pure stearic acid.

Its boiling point is the same as that of pure stearic acid.

Its melting point is different from pure stearic acid.

Its melting point is the same as that of pure stearic acid.

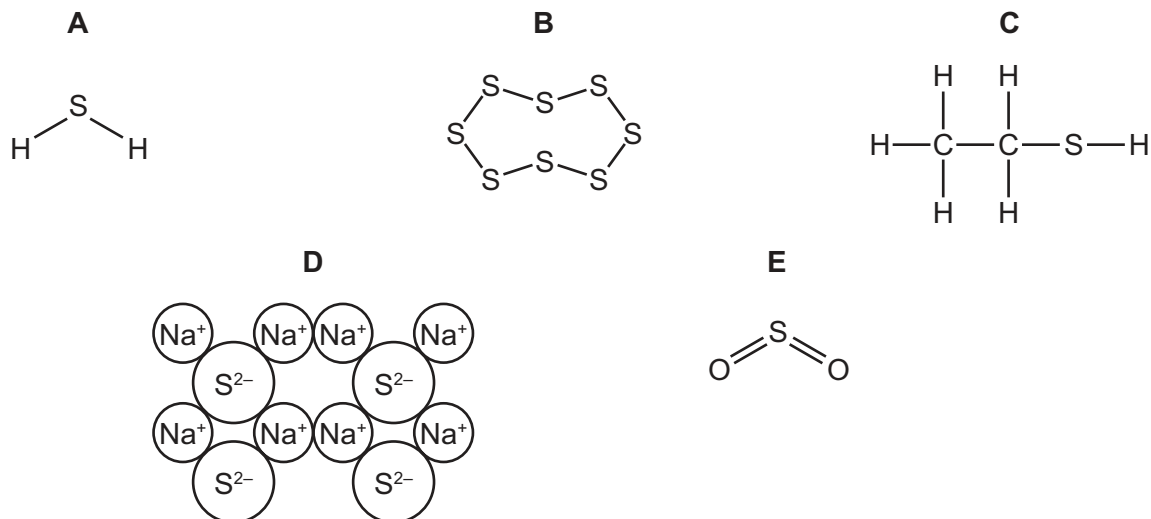
[1]

(ii) Describe **one** area of everyday life where the purity of substances is important.

..... [1]

[Total: 11]

2 The diagram below shows the structure of some substances, **A**, **B**, **C**, **D** and **E**.



(a) (i) Which **one** of these substances, **A**, **B**, **C**, **D** or **E**, is an element?

..... [1]

(ii) What do you understand by the term *element*?

..... [1]

(b) Calculate the relative molecular mass of **E**.

[1]

(c) Write the simplest formula for **D**.

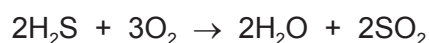
..... [1]

(d) Which substance, **A**, **B**, **C**, **D** or **E**, conducts electricity when it is molten?  
Explain your answer.

.....

..... [2]

(e) The equation for the combustion of substance **A** is shown below.



What type of chemical reaction is this?  
Put a ring around the correct answer.

**decomposition**      **neutralisation**      **oxidation**      **reversible**

[1]

[Total: 7]

3 Hydrochloric acid and ethanoic acid are both acidic in nature.

(a) Which **one** of the following is a pH value for an acidic solution.  
Put a ring around the correct answer.

pH 3

pH 7

pH 9

pH 13

[1]

(b) Describe how you would use litmus to test if a solution is acidic.

.....  
 .....  
 ..... [3]

(c) Acids react with metal carbonates.

(i) Write a word equation for the reaction of calcium carbonate with hydrochloric acid.

[3]

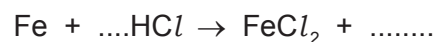
(ii) Calcium carbonate can be used to treat acidic soil.  
State **one** other use of calcium carbonate.

..... [1]

(iii) Name **one** other compound that can be used to treat acidic soil.

..... [1]

(d) Hydrochloric acid reacts with iron to form iron(II) chloride and hydrogen.  
Complete the equation for this reaction.



[2]

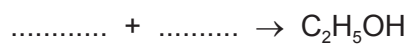
(e) (i) Complete the table below to show:

- the molecular formula for ethanoic acid
- the full structural formula for ethanol.

	ethanoic acid	ethanol
full structural formula	$  \begin{array}{c}  \text{H} \\    \\  \text{H}-\text{C}-\text{C} \\    \quad // \\  \text{H} \quad \text{O} \\  \quad \quad \backslash \\  \quad \quad \text{O}-\text{H}  \end{array}  $	
molecular formula		$\text{C}_2\text{H}_6\text{O}$

[2]

(ii) Ethanol can be manufactured by the catalytic addition of steam to ethene. Complete the equation for this reaction.



[1]

[Total: 14]

- 4 Fractional distillation is used to separate petroleum into different fractions. Each fraction has a particular use.

- (a) Match the fractions on the left with their uses on the right.  
The first one has been done for you.

gas oil	heating
bitumen	fuel for ships
lubricating fraction	surfacing roads
refinery gases	waxes and polishes
naphtha	making chemicals

[4]

- (b) Petroleum fractions contain hydrocarbons.  
What do you understand by the term *hydrocarbon*?

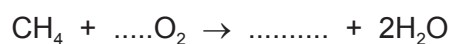
..... [1]

- (c) Methane, CH<sub>4</sub>, is a hydrocarbon.

- (i) Draw the structure of methane, showing all atoms and bonds.

[1]

- (ii) Complete the following equation for the burning of methane in excess oxygen.



[2]



- (iii) Methane belongs to a homologous series called the alkanes.  
What do you understand by the term *homologous series*?

.....

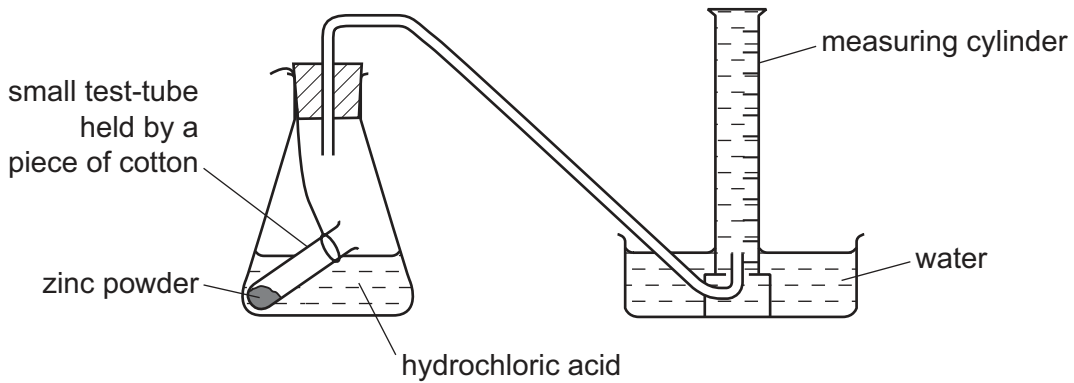
..... [2]

- (iv) Name the second member of the alkane homologous series.

..... [1]

[Total: 11]

- 5 A student investigated the reaction between zinc and hydrochloric acid using the apparatus shown below. The zinc was in excess.



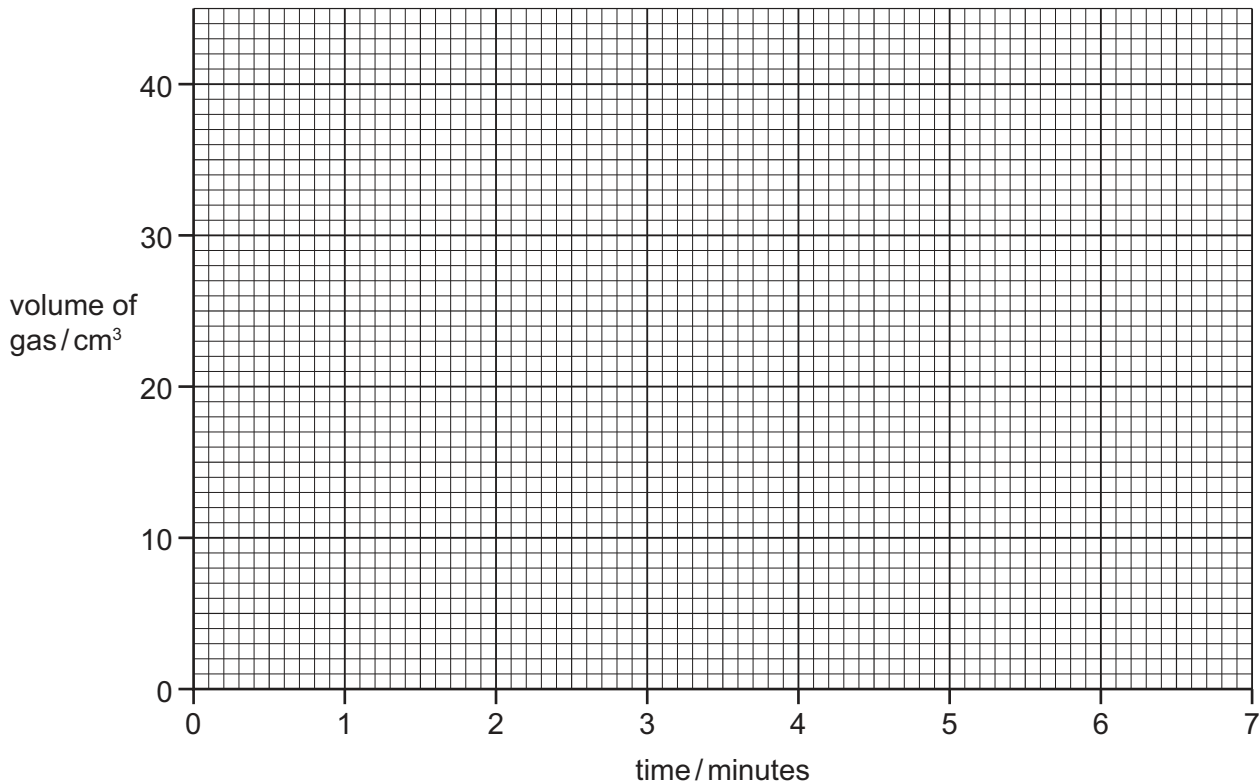
- (a) What should the student do to start the reaction?

..... [1]

- (b) The student measured the volume of gas in the measuring cylinder at minute intervals. The results are shown in the table.

time / minutes	0	1	2	3	4	5	6	7
volume of gas / cm <sup>3</sup>	0	15	23	30	33	35	35	35

- (i) Plot the results on the grid below and draw the best curve through the points.



[3]

(ii) Explain why the volume of gas stays the same after 5 minutes.

.....  
..... [2]

(c) Complete the following sentences about this reaction using words or phrases from the list below.

- |                      |                       |                  |
|----------------------|-----------------------|------------------|
| <b>concentration</b> | <b>decreases</b>      | <b>increases</b> |
| <b>speed</b>         | <b>stays the same</b> | <b>volume</b>    |

When the ..... of hydrochloric acid is increased, the volume of gas given off in the first two minutes ..... Decreasing the temperature of the reaction mixture ..... the ..... of the reaction. [4]

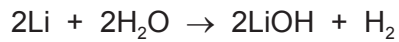
(d) When the reaction is complete, the flask contains a mixture of zinc and aqueous zinc chloride. Describe how you can obtain pure dry crystals of zinc chloride from this reaction mixture.

.....  
.....  
.....  
..... [3]

[Total: 13]

6 Lithium, sodium and potassium are in Group I of the Periodic Table.

(a) The equation for the reaction of lithium with water is



(i) Write a word equation for this reaction.

..... [2]

(ii) Sodium reacts with water in a similar way to lithium.  
Write a symbol equation for the reaction of sodium with water.

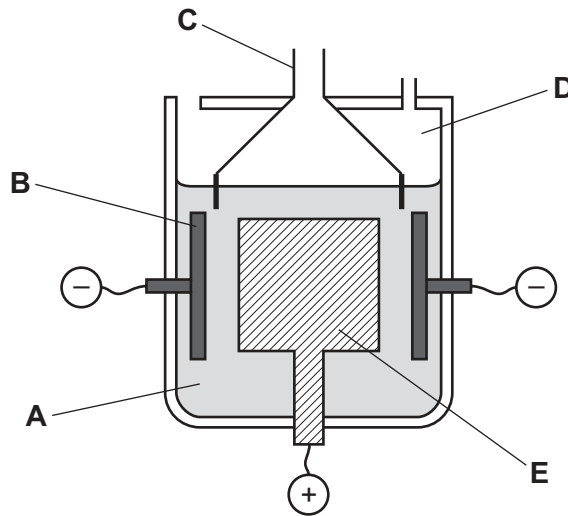
[1]

(b) Describe the reactions of lithium, sodium and potassium with water.  
In your description, write about:

- the difference in the reactivity of the metals
- the observations you would make when these metals react with water.

.....  
.....  
.....  
.....  
.....  
.....  
..... [5]

(c) The diagram below shows an electrolysis cell used to manufacture sodium from molten sodium chloride.



(i) Which letter in the diagram above represents  
the anode? .....

the electrolyte? ..... [2]

(ii) State the name of the product formed  
at the positive electrode, .....

at the negative electrode. .... [2]

(iii) Which one of the following substances is most likely to be used for the anode?  
Put a ring around the correct answer.

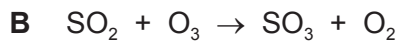
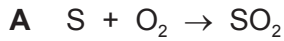
- graphite**      **iodine**      **magnesium**      **sodium** [1]

(d) Lithium, sodium and potassium are metals with a low density.  
State **two** other physical properties of these metals.

1. ....
2. .... [2]

[Total: 15]

7 (a) The equations **A** and **B** below show two reactions which lead to the formation of acid rain.



(i) Write a word equation for reaction **A**.

..... [2]

(ii) Which two of the following statements about reaction **B** are correct?  
Tick **two** boxes.

SO<sub>2</sub> is oxidised to SO<sub>3</sub>

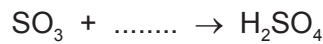
SO<sub>2</sub> is reduced to SO<sub>3</sub>

O<sub>3</sub> is reduced to O<sub>2</sub>

O<sub>3</sub> is oxidised to O<sub>2</sub>

[2]

(iii) Complete the equation to show how an aqueous solution of sulfuric acid, H<sub>2</sub>SO<sub>4</sub>, is formed from SO<sub>3</sub>.



[1]

(b) Describe and explain the effect of sulfuric acid on buildings made from limestone (calcium carbonate).

.....  
.....  
.....  
..... [3]

(c) State **one** effect of acid rain other than on buildings.

..... [1]

[Total: 9]



**DATA SHEET**  
**The Periodic Table of the Elements**

		Group																																																																																																																																																																																																																																																																																																																																																																																								
I	II	III	IV	V	VI	VII	0																																																																																																																																																																																																																																																																																																																																																																																			
7 <b>Li</b> Lithium 3	9 <b>Be</b> Beryllium 4	1 <b>H</b> Hydrogen 1	11 <b>B</b> Boron 5	12 <b>C</b> Carbon 6	13 <b>Al</b> Aluminium 13	14 <b>N</b> Nitrogen 7	15 <b>O</b> Oxygen 8	16 <b>F</b> Fluorine 9	17 <b>Ne</b> Neon 10	18 <b>Ar</b> Argon 18	19 <b>K</b> Potassium 19	20 <b>Ca</b> Calcium 20	21 <b>Sc</b> Scandium 21	22 <b>Ti</b> Titanium 22	23 <b>V</b> Vanadium 23	24 <b>Cr</b> Chromium 24	25 <b>Mn</b> Manganese 25	26 <b>Fe</b> Iron 26	27 <b>Co</b> Cobalt 27	28 <b>Ni</b> Nickel 28	29 <b>Cu</b> Copper 29	30 <b>Zn</b> Zinc 30	31 <b>Ga</b> Gallium 31	32 <b>Ge</b> Germanium 32	33 <b>As</b> Arsenic 33	34 <b>Se</b> Selenium 34	35 <b>Br</b> Bromine 35	36 <b>Kr</b> Krypton 36	37 <b>Rb</b> Rubidium 37	38 <b>Sr</b> Strontium 38	39 <b>Y</b> Yttrium 39	40 <b>Zr</b> Zirconium 40	41 <b>Nb</b> Niobium 41	42 <b>Mo</b> Molybdenum 42	43 <b>Tc</b> Technetium 43	44 <b>Ru</b> Ruthenium 44	45 <b>Rh</b> Rhodium 45	46 <b>Pd</b> Palladium 46	47 <b>Ag</b> Silver 47	48 <b>Cd</b> Cadmium 48	49 <b>In</b> Indium 49	50 <b>Sn</b> Tin 50	51 <b>Sb</b> Antimony 51	52 <b>Te</b> Tellurium 52	53 <b>I</b> Iodine 53	54 <b>Xe</b> Xenon 54	55 <b>Cs</b> Caesium 55	56 <b>Ba</b> Barium 56	57 <b>La</b> Lanthanum 57	72 <b>Hf</b> Hafnium 72	73 <b>Ta</b> Tantalum 73	74 <b>W</b> Tungsten 74	75 <b>Re</b> Rhenium 75	76 <b>Os</b> Osmium 76	77 <b>Ir</b> Iridium 77	78 <b>Pt</b> Platinum 78	79 <b>Au</b> Gold 79	80 <b>Hg</b> Mercury 80	81 <b>Tl</b> Thallium 81	82 <b>Pb</b> Lead 82	83 <b>Bi</b> Bismuth 83	84 <b>Po</b> Polonium 84	85 <b>At</b> Astatine 85	86 <b>Rn</b> Radon 86	87 <b>Fr</b> Francium 87	88 <b>Ra</b> Radium 88	89 <b>Ac</b> Actinium 89	90 <b>Th</b> Thorium 90	91 <b>Pa</b> Protactinium 91	92 <b>U</b> Uranium 92	93 <b>Np</b> Neptunium 93	94 <b>Pu</b> Plutonium 94	95 <b>Am</b> Americium 95	96 <b>Cm</b> Curium 96	97 <b>Bk</b> Berkelium 97	98 <b>Cf</b> Californium 98	99 <b>Es</b> Einsteinium 99	100 <b>Fm</b> Fermium 100	101 <b>Md</b> Mendelevium 101	102 <b>No</b> Nobelium 102	103 <b>Lr</b> Lawrencium 103	104 <b>Rf</b> Rutherfordium 104	105 <b>Db</b> Dubnium 105	106 <b>Sg</b> Seaborgium 106	107 <b>Bh</b> Bohrium 107	108 <b>Hs</b> Hassium 108	109 <b>Mt</b> Meitnerium 109	110 <b>Ds</b> Darmstadtium 110	111 <b>Rg</b> Roentgenium 111	112 <b>Cn</b> Copernicium 112	113 <b>Nh</b> Nihonium 113	114 <b>Fl</b> Flerovium 114	115 <b>Lv</b> Livermorium 115	116 <b>Ts</b> Tennessine 116	117 <b>Og</b> Oganesson 117	118 <b>Uu</b> Ununseptium 118	119 <b>Uub</b> Ununseptium 119	120 <b>Uuq</b> Unquadium 120	121 <b>Uuq</b> Unquadium 121	122 <b>Uuq</b> Unquadium 122	123 <b>Uuq</b> Unquadium 123	124 <b>Uuq</b> Unquadium 124	125 <b>Uuq</b> Unquadium 125	126 <b>Uuq</b> Unquadium 126	127 <b>Uuq</b> Unquadium 127	128 <b>Uuq</b> Unquadium 128	129 <b>Uuq</b> Unquadium 129	130 <b>Uuq</b> Unquadium 130	131 <b>Uuq</b> Unquadium 131	132 <b>Uuq</b> Unquadium 132	133 <b>Uuq</b> Unquadium 133	134 <b>Uuq</b> Unquadium 134	135 <b>Uuq</b> Unquadium 135	136 <b>Uuq</b> Unquadium 136	137 <b>Uuq</b> Unquadium 137	138 <b>Uuq</b> Unquadium 138	139 <b>Uuq</b> Unquadium 139	140 <b>Uuq</b> Unquadium 140	141 <b>Uuq</b> Unquadium 141	142 <b>Uuq</b> Unquadium 142	143 <b>Uuq</b> Unquadium 143	144 <b>Uuq</b> Unquadium 144	145 <b>Uuq</b> Unquadium 145	146 <b>Uuq</b> Unquadium 146	147 <b>Uuq</b> Unquadium 147	148 <b>Uuq</b> Unquadium 148	149 <b>Uuq</b> Unquadium 149	150 <b>Uuq</b> Unquadium 150	151 <b>Uuq</b> Unquadium 151	152 <b>Uuq</b> Unquadium 152	153 <b>Uuq</b> Unquadium 153	154 <b>Uuq</b> Unquadium 154	155 <b>Uuq</b> Unquadium 155	156 <b>Uuq</b> Unquadium 156	157 <b>Uuq</b> Unquadium 157	158 <b>Uuq</b> Unquadium 158	159 <b>Uuq</b> Unquadium 159	160 <b>Uuq</b> Unquadium 160	161 <b>Uuq</b> Unquadium 161	162 <b>Uuq</b> Unquadium 162	163 <b>Uuq</b> Unquadium 163	164 <b>Uuq</b> Unquadium 164	165 <b>Uuq</b> Unquadium 165	166 <b>Uuq</b> Unquadium 166	167 <b>Uuq</b> Unquadium 167	168 <b>Uuq</b> Unquadium 168	169 <b>Uuq</b> Unquadium 169	170 <b>Uuq</b> Unquadium 170	171 <b>Uuq</b> Unquadium 171	172 <b>Uuq</b> Unquadium 172	173 <b>Uuq</b> Unquadium 173	174 <b>Uuq</b> Unquadium 174	175 <b>Uuq</b> Unquadium 175	176 <b>Uuq</b> Unquadium 176	177 <b>Uuq</b> Unquadium 177	178 <b>Uuq</b> Unquadium 178	179 <b>Uuq</b> Unquadium 179	180 <b>Uuq</b> Unquadium 180	181 <b>Uuq</b> Unquadium 181	182 <b>Uuq</b> Unquadium 182	183 <b>Uuq</b> Unquadium 183	184 <b>Uuq</b> Unquadium 184	185 <b>Uuq</b> Unquadium 185	186 <b>Uuq</b> Unquadium 186	187 <b>Uuq</b> Unquadium 187	188 <b>Uuq</b> Unquadium 188	189 <b>Uuq</b> Unquadium 189	190 <b>Uuq</b> Unquadium 190	191 <b>Uuq</b> Unquadium 191	192 <b>Uuq</b> Unquadium 192	193 <b>Uuq</b> Unquadium 193	194 <b>Uuq</b> Unquadium 194	195 <b>Uuq</b> Unquadium 195	196 <b>Uuq</b> Unquadium 196	197 <b>Uuq</b> Unquadium 197	198 <b>Uuq</b> Unquadium 198	199 <b>Uuq</b> Unquadium 199	200 <b>Uuq</b> Unquadium 200	201 <b>Uuq</b> Unquadium 201	202 <b>Uuq</b> Unquadium 202	203 <b>Uuq</b> Unquadium 203	204 <b>Uuq</b> Unquadium 204	205 <b>Uuq</b> Unquadium 205	206 <b>Uuq</b> Unquadium 206	207 <b>Uuq</b> Unquadium 207	208 <b>Uuq</b> Unquadium 208	209 <b>Uuq</b> Unquadium 209	210 <b>Uuq</b> Unquadium 210	211 <b>Uuq</b> Unquadium 211	212 <b>Uuq</b> Unquadium 212	213 <b>Uuq</b> Unquadium 213	214 <b>Uuq</b> Unquadium 214	215 <b>Uuq</b> Unquadium 215	216 <b>Uuq</b> Unquadium 216	217 <b>Uuq</b> Unquadium 217	218 <b>Uuq</b> Unquadium 218	219 <b>Uuq</b> Unquadium 219	220 <b>Uuq</b> Unquadium 220	221 <b>Uuq</b> Unquadium 221	222 <b>Uuq</b> Unquadium 222	223 <b>Uuq</b> Unquadium 223	224 <b>Uuq</b> Unquadium 224	225 <b>Uuq</b> Unquadium 225	226 <b>Uuq</b> Unquadium 226	227 <b>Uuq</b> Unquadium 227	228 <b>Uuq</b> Unquadium 228	229 <b>Uuq</b> Unquadium 229	230 <b>Uuq</b> Unquadium 230	231 <b>Uuq</b> Unquadium 231	232 <b>Uuq</b> Unquadium 232	233 <b>Uuq</b> Unquadium 233	234 <b>Uuq</b> Unquadium 234	235 <b>Uuq</b> Unquadium 235	236 <b>Uuq</b> Unquadium 236	237 <b>Uuq</b> Unquadium 237	238 <b>Uuq</b> Unquadium 238	239 <b>Uuq</b> Unquadium 239	240 <b>Uuq</b> Unquadium 240	241 <b>Uuq</b> Unquadium 241	242 <b>Uuq</b> Unquadium 242	243 <b>Uuq</b> Unquadium 243	244 <b>Uuq</b> Unquadium 244	245 <b>Uuq</b> Unquadium 245	246 <b>Uuq</b> Unquadium 246	247 <b>Uuq</b> Unquadium 247	248 <b>Uuq</b> Unquadium 248	249 <b>Uuq</b> Unquadium 249	250 <b>Uuq</b> Unquadium 250	251 <b>Uuq</b> Unquadium 251	252 <b>Uuq</b> Unquadium 252	253 <b>Uuq</b> Unquadium 253	254 <b>Uuq</b> Unquadium 254	255 <b>Uuq</b> Unquadium 255	256 <b>Uuq</b> Unquadium 256	257 <b>Uuq</b> Unquadium 257	258 <b>Uuq</b> Unquadium 258	259 <b>Uuq</b> Unquadium 259	260 <b>Uuq</b> Unquadium 260	261 <b>Uuq</b> Unquadium 261	262 <b>Uuq</b> Unquadium 262	263 <b>Uuq</b> Unquadium 263	264 <b>Uuq</b> Unquadium 264	265 <b>Uuq</b> Unquadium 265	266 <b>Uuq</b> Unquadium 266	267 <b>Uuq</b> Unquadium 267	268 <b>Uuq</b> Unquadium 268	269 <b>Uuq</b> Unquadium 269	270 <b>Uuq</b> Unquadium 270	271 <b>Uuq</b> Unquadium 271	272 <b>Uuq</b> Unquadium 272	273 <b>Uuq</b> Unquadium 273	274 <b>Uuq</b> Unquadium 274	275 <b>Uuq</b> Unquadium 275	276 <b>Uuq</b> Unquadium 276	277 <b>Uuq</b> Unquadium 277	278 <b>Uuq</b> Unquadium 278	279 <b>Uuq</b> Unquadium 279	280 <b>Uuq</b> Unquadium 280	281 <b>Uuq</b> Unquadium 281	282 <b>Uuq</b> Unquadium 282	283 <b>Uuq</b> Unquadium 283	284 <b>Uuq</b> Unquadium 284	285 <b>Uuq</b> Unquadium 285	286 <b>Uuq</b> Unquadium 286	287 <b>Uuq</b> Unquadium 287	288 <b>Uuq</b> Unquadium 288	289 <b>Uuq</b> Unquadium 289	290 <b>Uuq</b> Unquadium 290	291 <b>Uuq</b> Unquadium 291	292 <b>Uuq</b> Unquadium 292	293 <b>Uuq</b> Unquadium 293	294 <b>Uuq</b> Unquadium 294	295 <b>Uuq</b> Unquadium 295	296 <b>Uuq</b> Unquadium 296	297 <b>Uuq</b> Unquadium 297	298 <b>Uuq</b> Unquadium 298	299 <b>Uuq</b> Unquadium 299	300 <b>Uuq</b> Unquadium 300	301 <b>Uuq</b> Unquadium 301	302 <b>Uuq</b> Unquadium 302	303 <b>Uuq</b> Unquadium 303	304 <b>Uuq</b> Unquadium 304	305 <b>Uuq</b> Unquadium 305	306 <b>Uuq</b> Unquadium 306	307 <b>Uuq</b> Unquadium 307	308 <b>Uuq</b> Unquadium 308	309 <b>Uuq</b> Unquadium 309	310 <b>Uuq</b> Unquadium 310	311 <b>Uuq</b> Unquadium 311	312 <b>Uuq</b> Unquadium 312	313 <b>Uuq</b> Unquadium 313	314 <b>Uuq</b> Unquadium 314	315 <b>Uuq</b> Unquadium 315	316 <b>Uuq</b> Unquadium 316	317 <b>Uuq</b> Unquadium 317	318 <b>Uuq</b> Unquadium 318	319 <b>Uuq</b> Unquadium 319	320 <b>Uuq</b> Unquadium 320	321 <b>Uuq</b> Unquadium 321	322 <b>Uuq</b> Unquadium 322	323 <b>Uuq</b> Unquadium 323	324 <b>Uuq</b> Unquadium 324	325 <b>Uuq</b> Unquadium 325	326 <b>Uuq</b> Unquadium 326	327 <b>Uuq</b> Unquadium 327	328 <b>Uuq</b> Unquadium 328	329 <b>Uuq</b> Unquadium 329	330 <b>Uuq</b> Unquadium 330	331 <b>Uuq</b> Unquadium 331	332 <b>Uuq</b> Unquadium 332	333 <b>Uuq</b> Unquadium 333	334 <b>Uuq</b> Unquadium 334	335 <b>Uuq</b> Unquadium 335	336 <b>Uuq</b> Unquadium 336	337 <b>Uuq</b> Unquadium 337	338 <b>Uuq</b> Unquadium 338	339 <b>Uuq</b> Unquadium 339	340 <b>Uuq</b> Unquadium 340	341 <b>Uuq</b> Unquadium 341	342 <b>Uuq</b> Unquadium 342	343 <b>Uuq</b> Unquadium 343	344 <b>Uuq</b> Unquadium 344	345 <b>Uuq</b> Unquadium 345	346 <b>Uuq</b> Unquadium 346	347 <b>Uuq</b> Unquadium 347	348 <b>Uuq</b> Unquadium 348	349 <b>Uuq</b> Unquadium 349	350 <b>Uuq</b> Unquadium 350	351 <b>Uuq</b> Unquadium 351	352 <b>Uuq</b> Unquadium 352	353 <b>Uuq</b> Unquadium 353	354 <b>Uuq</b> Unquadium 354	355 <b>Uuq</b> Unquadium 355	356 <b>Uuq</b> Unquadium 356	357 <b>Uuq</b> Unquadium 357	358 <b>Uuq</b> Unquadium 358	359 <b>Uuq</b> Unquadium 359	360 <b>Uuq</b> Unquadium 360	361 <b>Uuq</b> Unquadium 361	362 <b>Uuq</b> Unquadium 362	363 <b>Uuq</b> Unquadium 363	364 <b>Uuq</b> Unquadium 364	365 <b>Uuq</b> Unquadium 365	366 <b>Uuq</b> Unquadium 366	367 <b>Uuq</b> Unquadium 367	368 <b>Uuq</b> Unquadium 368	369 <b>Uuq</b> Unquadium 369	370 <b>Uuq</b> Unquadium 370	371 <b>Uuq</b> Unquadium 371	372 <b>Uuq</b> Unquadium 372	373 <b>Uuq</b> Unquadium 373	374 <b>Uuq</b> Unquadium 374	375 <b>Uuq</b> Unquadium 375	376 <b>Uuq</b> Unquadium 376	377 <b>Uuq</b> Unquadium 377	378 <b>Uuq</b> Unquadium 378	379 <b>Uuq</b> Unquadium 379	380 <b>Uuq</b> Unquadium 380	381 <b>Uuq</b> Unquadium 381	382 <b>Uuq</b> Unquadium 382	383 <b>Uuq</b> Unquadium 383	384 <b>Uuq</b> Unquadium 384	385 <b>Uuq</b> Unquadium 385	386 <b>Uuq</b> Unquadium 386	387 <b>Uuq</b> Unquadium 387	388 <b>Uuq</b> Unquadium 388	389 <b>Uuq</b> Unquadium 389	390 <b>Uuq</b> Unquadium 390	391 <b>Uuq</b> Unquadium 391	392 <b>Uuq</b> Unquadium 392	393 <b>Uuq</b> Unquadium 393	394 <b>Uuq</b> Unquadium 394	395 <b>Uuq</b> Unquadium 395	396 <b>Uuq</b> Unquadium 396	397 <b>Uuq</b> Unquadium 397	398 <b>Uuq</b> Unquadium 398	399 <b>Uuq</b> Unquadium 399	400 <b>Uuq</b> Unquadium 400

\*58-71 Lanthanoid series  
†90-103 Actinoid series

a	<b>X</b>
b	

Key  
a = relative atomic mass  
x = atomic symbol  
b = proton (atomic) number

The volume of one mole of any gas is 24 dm<sup>3</sup> at room temperature and pressure (r.t.p.).

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