

Candidate Name: _____

Centre Number	Candidate Number									

EXAMINATIONS COUNCIL OF ZAMBIA

Examination for School Certificate Ordinary Level

Chemistry

PAPER 2 Theory

Thursday

15 OCTOBER 2015

5070/2

Candidates answer on the question paper.
Additional materials:

Answer Booklet
Mathematical tables or calculator (non programmable)
Graph paper

Time: 2 hours

Instructions to candidates

Write your **name**, **centre number** and **candidate number** in the spaces at the top of this page and on any separate answer paper used.

There are 12 questions in this paper.

Section A

Answer all questions.

Write your answers in the spaces provided on the question paper.

Section B

Answer any **three** questions.

Write your answers in the separate Answer Booklet provided.

At the end of the examination, fasten your Answer Booklets securely to the question paper.

Information for candidates

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

The **Periodic Table** is printed on page 14.

Cell phones are not allowed in the examination room.

FOR EXAMINER'S USE	
Section A	
B 9	
B 10	
B 11	
B 12	
TOTAL	

Section A: [50 marks]

Answer all questions in the spaces provided.

- A1** The kinetic theory of matter explains the way in which solids, liquids and gases behave.

Describe the movement of particles in

- (a)** solids

.....

.....

.....

..... [2]

- (b)** liquids

.....

.....

..... [2]

- (c)** gases

.....

.....

..... [2]

[Total 6]

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- A2** The apparatus below was used in the extraction of ethanol from fermented maize grain.

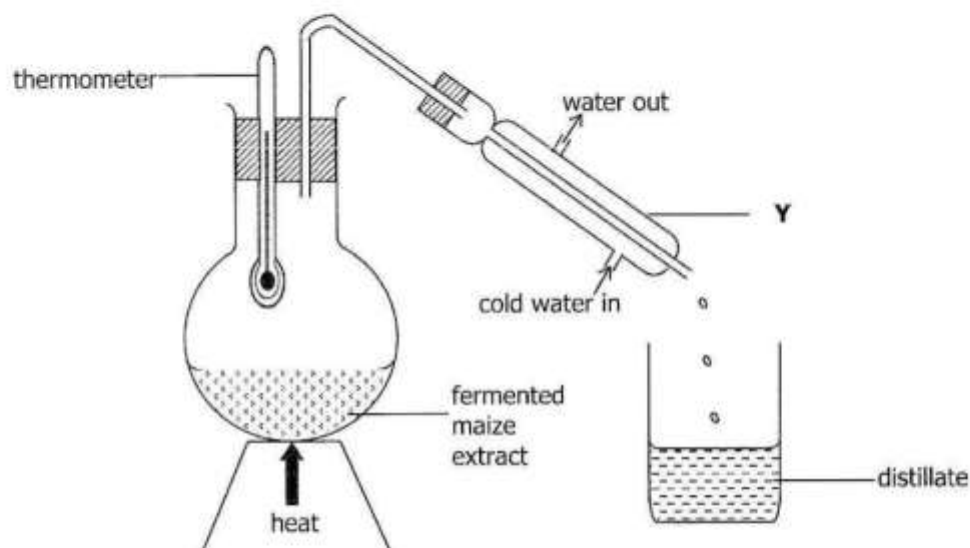
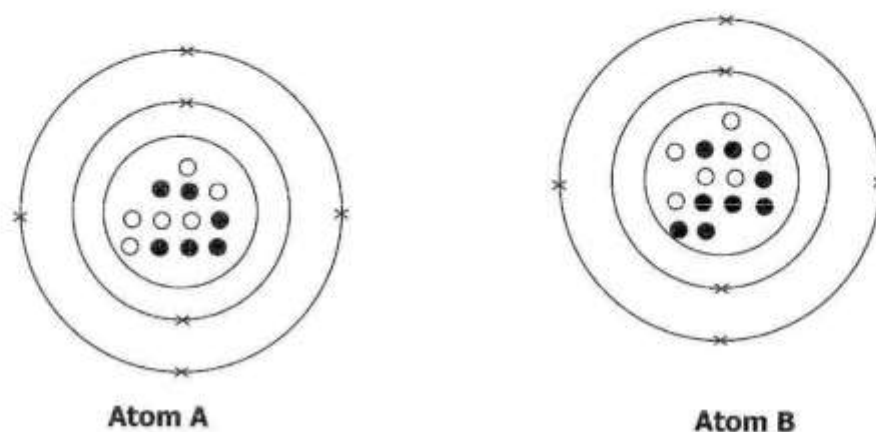


Figure 2.1

- (a) Name the apparatus labelled **Y**.
 [1]
- (b) What improvement can be made to the above arrangement to get pure ethanol?
 [1]
- (c) State the purpose of the cold water which passes through **Y**.
 [1]
- (d) Name the separation technique being used above.
 [1]
- (e) State an industrial application for the technique shown in the diagram above.
 [1]
- [Total 5]**

A3 An element has 3 types of atoms. Two of these are shown below:



Key

- Proton
- Neutron
- × Electron

Figure 3.1

(a) What is different about these two atoms?

.....
 [1]

(b) What term is used to describe such atoms?

..... [1]

(c) What is the difference in nucleon number between atoms **A** and **B**?

..... [1]

(d) Atom **B** is radioactive. Explain what this means.

.....
 [2]

[Total 5]

- A4** A sample of iron filings had partly rusted upon being left under damp conditions. 3.5g of the iron filings were added to 50cm³ of aqueous copper (II) sulphate. All the copper in copper (II) sulphate was displaced according to the equation below:



3.2g of copper was formed.

- (a)** Write the ionic equation for the above equation.

.....
 [1]

- (b)** If neither the iron nor the copper (II) sulphate was in excess, calculate

- (i)** the mass of iron which was present in the iron filings sample.

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[3]

- (ii)** the percentage by mass of rust in the iron filings sample.

[2]

- (iii)** the concentration of the copper (II) sulphate solution in moles per dm³

[3]

[Total 9]

A5 Use the Periodic Table to help you answer the following questions about the element selenium, atomic number 34.

(a) In which Period is selenium?

..... [1]

(b) In an atom of selenium, how many

(i) valency electrons are present?

..... [1]

(ii) neutrons are present?

..... [1]

(c) Would you expect selenium to be a metal or a non-metal? Give one reason for your answer.

.....

.....

..... [2]

(d) Write the formula of the compound formed between selenium and calcium.

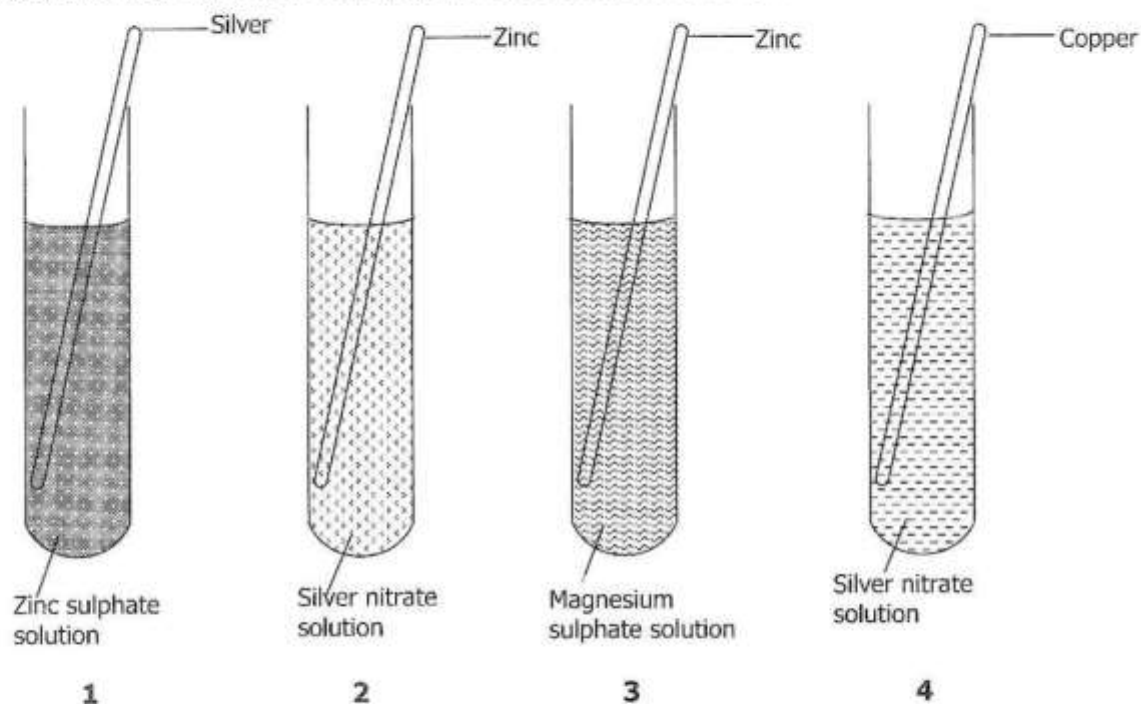
.....

.....

..... [1]

[Total 6]

A6 Study the diagrams below and answer the questions which follow.



(a) In which test tube(s) do the following occur?

(i) Zinc atoms become zinc ions.

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..... [1]

(ii) Silver ions [Ag^+] become silver atoms.

..... [1]

(iii) There is no reaction.

..... [1]

(iv) Metal atoms are oxidised.

.....
 [1]

(b) Write a chemical equation for **one** reaction from any tube.

.....
 [1]

[Total 5]

A7 (a) Diesel and Petrol are used in many different ways.

(i) In which way are the two similar in their use?

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

(ii) What general term is used to describe such substances.

..... [1]

(b) A certain hydrocarbon has molecular mass of 58. 11.6g of this hydrocarbon is completely burnt.

(i) Calculate the number of moles of the hydrocarbon that were burnt.

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(ii) If one mole of this hydrocarbon produced 2880KJ of heat on complete combustion, how much energy would 11.6g of the hydrocarbon produce on complete combustion?

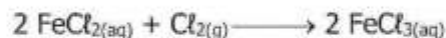
[2]

(iii) Why is it dangerous to burn coal in a limited supply of air?

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

[Total 7]

- A8** When chlorine gas is bubbled through iron (II) chloride, the following reaction occurs:



- (a)** What colour change is observed in this reaction?

..... [1]

- (b)** The above reaction is a redox reaction. State with a reason which substance is

- (i)** reduced.

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

- (ii)** the oxidising agent.

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

- (c)** Write an ionic equation for the reaction above.

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

[Total 7]

Section B (45 marks)

Answer **three** questions from this section.

Write your answers in the **Answer Booklet** provided.

B9 When an acid reacts with an alkali, a salt and water are formed.

(a) What term is used to describe a reaction between an acid and an alkali?
Write an ionic equation for this reaction. [3]

(b) Acids can be classified as 'weak' or 'strong'. Explain what is meant by the terms 'weak' and 'strong' when referred to acids. Give one example of each type of acid. [4]

(c) The word equation for the reaction used to form the insoluble salt barium sulphate, is shown below.

Barium nitrate + Sodium sulphate $\longrightarrow$ Barium sulphate + Sodium nitrate

(i) Write an ionic equation for this reaction.

(ii) Describe how a pure, dry sample of Barium sulphate can be obtained from the reaction mixture.

(iii) What term is used to describe the method used to prepare the Barium sulphate? [5]

(d) Oxides are classified as acidic, basic or amphoteric.

(i) What is an amphoteric oxide?

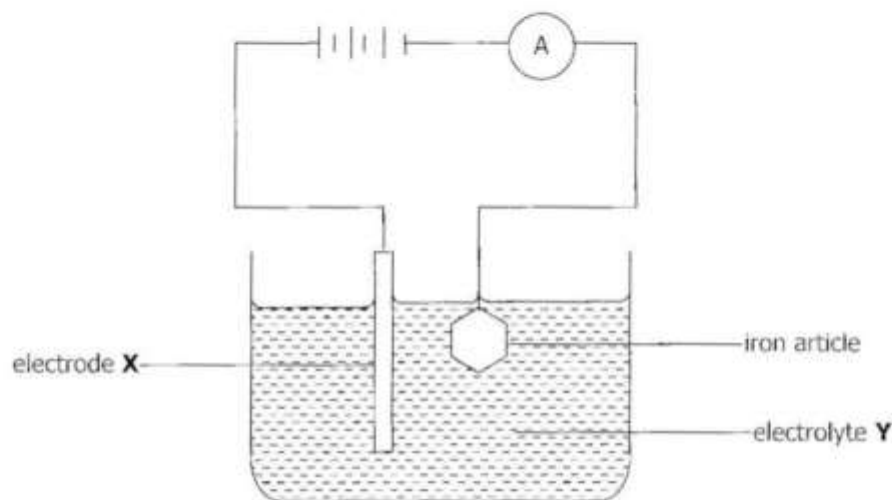
(ii) What products are formed when a basic oxide reacts with an acid.

(iii) Which of the oxides below is likely to be an acidic oxide?

MgO, CuO, SiO₂, Al₂O₃, Na₂O [3]

[Total 15]

- B10** The diagram below shows apparatus used in the silver-plating of an iron article. During the electroplating, a current of 5A was passed through the aqueous electrolyte for 8.0 minutes.

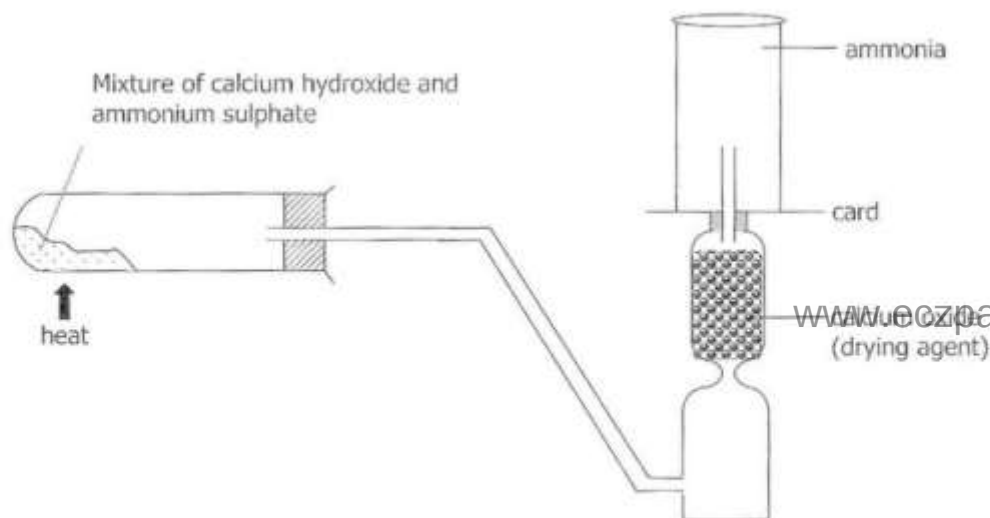


- (a) (i) What is meant by electroplating?
(ii) State **one** reason why electroplating is used. [2]
- (b) State the names of electrode **X** and electrolyte **Y** which must be used in order for successful plating to occur. [3]
- (c) Write equations for the reactions occurring at the electrodes. [2]
- (d) What mass of silver is deposited on the iron article? [3]
- (e) What change is seen at the anode during the electrolysis of electrolyte **Y**? [1]
- (f) If the iron article was to be coated with copper instead of silver, state the materials needed to be used for electrode **X** and electrolyte **Y**. [2]
- (g) State **two** other applications of electrolysis. [2]

[Total 15]

B11 Ammonia is an essential industrial product which is manufactured by the Haber process.

- (a) Give **two** reasons why ammonia is an essential product. [2]
- (b) Write the equations for the reaction in which ammonia is produced by the Haber Process. Include state symbols. [2]
- (c) State the raw materials from which the two reactants used to make ammonia are obtained. [2]
- (d) State the conditions needed to obtain a satisfactory yield of ammonia by the Haber Process. [3]
- (e) Ammonia can be prepared in the laboratory by heating a mixture of calcium hydroxide and ammonium sulphate as shown in the diagram below.



- (i) Write the equation for the reaction of calcium hydroxide with ammonium sulphate. [2]
- (ii) Describe a chemical test for ammonia gas. [2]
- (iii) Explain why concentrated sulphuric acid is not suitable for drying the ammonia gas. [2]

[Total 15]

B12 The table shows the first four members of a particular homologous series.

Compound	Molecular formula	Relative molecular mass
Methanol	CH ₃ OH	32
Ethanol	C ₂ H ₅ OH	46
Propanol	C ₃ H ₇ OH	60
Butanol	C ₄ H ₉ OH	?

- (a) (i) Name the homologous series to which these compounds belong. [1]
- (ii) Deduce the general formula of this homologous series. [1]
- (iii) State the relative molecular mass of butanol. [1]
- (b) Ethanol can be manufactured from either ethene or glucose.
- (i) Construct an equation for the production of ethanol from ethene using structural formulae. [2]
- (ii) State the conditions necessary for the reaction in **b(i)** above. [2]
- (iii) The fermentation of glucose can be represented by the following equation.
- $$C_6H_{12}O_6 \longrightarrow 2C_2H_5OH + 2CO_2$$
- Calculate the maximum mass of ethanol that can be made from 72 tonnes of glucose. [3]
- (c) State a use of ethanol, other than in alcoholic drinks. [1]
- (d) Ethanol can be oxidized to form ethanoic acid.
- (i) Draw the structure of ethanoic acid, showing all the bonds. [1]
- (ii) Name the organic compound formed when ethanol reacts with ethanoic acid. [1]
- (iii) Draw the structure of the compound you have named in **d(ii)** above. [1]
- (iv) State **one** condition necessary for the reaction of ethanol with ethanoic acid. [1]

[Total 15]

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

Group		I	II											III	IV	V	VI	VII	(I)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
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7 Li Lithium 3	9 Be Beryllium 4	23 Na Sodium 11	24 Mg Magnesium 12	39 K Potassium 19	40 Ca Calcium 20	45 Sc Scandium 21	48 Ti Titanium 22	51 V Vanadium 23	52 Cr Chromium 24	55 Mn Manganese 25	56 Fe Iron 26	59 Co Cobalt 27	59 Ni Nickel 28	64 Cu Copper 29	65 Zn Zinc 30	70 Ga Gallium 31	73 Ge Germanium 32	75 As Arsenic 33	79 Se Selenium 34	80 Br Bromine 35	84 Kr Krypton 36																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
85 Rb Rubidium 37	88 Sr Strontium 38	133 Cs Cesium 55	137 Ba Barium 56	139 La Lanthanum 57	140 Ce Cerium 58	141 Pr Praseodymium 59	144 Nd Neodymium 60	147 Pm Promethium 61	150 Sm Samarium 62	152 Eu Europium 63	157 Gd Gadolinium 64	159 Tb Terbium 65	162 Dy Dysprosium 66	165 Ho Holmium 67	167 Er Erbium 68	173 Yb Ytterbium 70	175 Lu Lutetium 71	177 Hf Hafnium 72	181 Ta Tantalum 73	184 W Tungsten 74	186 Re Rhenium 75	190 Os Osmium 76	192 Ir Iridium 77	195 Pt Platinum 78	197 Au Gold 79	201 Hg Mercury 80	204 Tl Thallium 81	207 Pb Lead 82	209 Bi Bismuth 83	210 Po Polonium 84	210 At Astatine 85	210 Rn Radon 86																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
226 Fr Francium 87	227 Ra Radium 88	227 Ac Actinium 89	232 Th Thorium 90	232 Pa Protactinium 91	238 U Uranium 92	238 Np Neptunium 93	238 Pu Plutonium 94	244 Am Americium 95	244 Cm Curium 96	247 Bk Berkelium 97	247 Cf Californium 98	251 Es Einsteinium 99	252 Fm Fermium 100	257 Md Mendelevium 101	258 No Nobelium 102	259 Lr Lawrencium 103	261 Rf Rutherfordium 104	261 Db Dubnium 105	262 Sg Seaborgium 106	263 Bh Bohrium 107	263 Hs Hassium 108	264 Mt Meitnerium 109	266 Lv Livermorium 110	268 Ts Tennessine 111	268 Og Oganesson 112	271 Nh Nihonium 113	272 Fl Flerovium 114	274 Mc Moscovium 115	276 Lv Livermorium 116	278 Ts Tennessine 117	280 Og Oganesson 118	281 Nh Nihonium 119	282 Fl Flerovium 120	285 Mc Moscovium 121	286 Lv Livermorium 122	288 Ts Tennessine 123	290 Og Oganesson 124	291 Nh Nihonium 125	292 Fl Flerovium 126	294 Mc Moscovium 127	296 Lv Livermorium 128	298 Ts Tennessine 129	300 Og Oganesson 130	301 Nh Nihonium 131	302 Fl Flerovium 132	304 Mc Moscovium 133	306 Lv Livermorium 134	308 Ts Tennessine 135	310 Og Oganesson 136	311 Nh Nihonium 137	312 Fl Flerovium 138	314 Mc Moscovium 139	316 Lv Livermorium 140	318 Ts Tennessine 141	320 Og Oganesson 142	321 Nh Nihonium 143	322 Fl Flerovium 144	324 Mc Moscovium 145	326 Lv Livermorium 146	328 Ts Tennessine 147	330 Og Oganesson 148	331 Nh Nihonium 149	332 Fl Flerovium 150	334 Mc Moscovium 151	336 Lv Livermorium 152	338 Ts Tennessine 153	340 Og Oganesson 154	341 Nh Nihonium 155	342 Fl Flerovium 156	344 Mc Moscovium 157	346 Lv Livermorium 158	348 Ts Tennessine 159	350 Og Oganesson 160	351 Nh Nihonium 161	352 Fl Flerovium 162	354 Mc Moscovium 163	356 Lv Livermorium 164	358 Ts Tennessine 165	360 Og Oganesson 166	361 Nh Nihonium 167	362 Fl Flerovium 168	364 Mc Moscovium 169	366 Lv Livermorium 170	368 Ts Tennessine 171	370 Og Oganesson 172	371 Nh Nihonium 173	372 Fl Flerovium 174	374 Mc Moscovium 175	376 Lv Livermorium 176	378 Ts Tennessine 177	380 Og Oganesson 178	381 Nh Nihonium 179	382 Fl Flerovium 180	384 Mc Moscovium 181	386 Lv Livermorium 182	388 Ts Tennessine 183	390 Og Oganesson 184	391 Nh Nihonium 185	392 Fl Flerovium 186	394 Mc Moscovium 187	396 Lv Livermorium 188	398 Ts Tennessine 189	400 Og Oganesson 190	401 Nh Nihonium 191	402 Fl Flerovium 192	404 Mc Moscovium 193	406 Lv Livermorium 194	408 Ts Tennessine 195	410 Og Oganesson 196	411 Nh Nihonium 197	412 Fl Flerovium 198	414 Mc Moscovium 199	416 Lv Livermorium 200	418 Ts Tennessine 201	420 Og Oganesson 202	421 Nh Nihonium 203	422 Fl Flerovium 204	424 Mc Moscovium 205	426 Lv Livermorium 206	428 Ts Tennessine 207	430 Og Oganesson 208	431 Nh Nihonium 209	432 Fl Flerovium 210	434 Mc Moscovium 211	436 Lv Livermorium 212	438 Ts Tennessine 213	440 Og Oganesson 214	441 Nh Nihonium 215	442 Fl Flerovium 216	444 Mc Moscovium 217	446 Lv Livermorium 218	448 Ts Tennessine 219	450 Og Oganesson 220	451 Nh Nihonium 221	452 Fl Flerovium 222	454 Mc Moscovium 223	456 Lv Livermorium 224	458 Ts Tennessine 225	460 Og Oganesson 226	461 Nh Nihonium 227	462 Fl Flerovium 228	464 Mc Moscovium 229	466 Lv Livermorium 230	468 Ts Tennessine 231	470 Og Oganesson 232	471 Nh Nihonium 233	472 Fl Flerovium 234	474 Mc Moscovium 235	476 Lv Livermorium 236	478 Ts Tennessine 237	480 Og Oganesson 238	481 Nh Nihonium 239	482 Fl Flerovium 240	484 Mc Moscovium 241	486 Lv Livermorium 242	488 Ts Tennessine 243	490 Og Oganesson 244	491 Nh Nihonium 245	492 Fl Flerovium 246	494 Mc Moscovium 247	496 Lv Livermorium 248	498 Ts Tennessine 249	500 Og Oganesson 250	501 Nh Nihonium 251	502 Fl Flerovium 252	504 Mc Moscovium 253	506 Lv Livermorium 254	508 Ts Tennessine 255	510 Og Oganesson 256	511 Nh Nihonium 257	512 Fl Flerovium 258	514 Mc Moscovium 259	516 Lv Livermorium 260	518 Ts Tennessine 261	520 Og Oganesson 262	521 Nh Nihonium 263	522 Fl Flerovium 264	524 Mc Moscovium 265	526 Lv Livermorium 266	528 Ts Tennessine 267	530 Og Oganesson 268	531 Nh Nihonium 269	532 Fl Flerovium 270	534 Mc Moscovium 271	536 Lv Livermorium 272	538 Ts Tennessine 273	540 Og Oganesson 274	541 Nh Nihonium 275	542 Fl Flerovium 276	544 Mc Moscovium 277	546 Lv Livermorium 278	548 Ts Tennessine 279	550 Og Oganesson 280	551 Nh Nihonium 281	552 Fl Flerovium 282	554 Mc Moscovium 283	556 Lv Livermorium 284	558 Ts Tennessine 285	560 Og Oganesson 286	561 Nh Nihonium 287	562 Fl Flerovium 288	564 Mc Moscovium 289	566 Lv Livermorium 290	568 Ts Tennessine 291	570 Og Oganesson 292	571 Nh Nihonium 293	572 Fl Flerovium 294	574 Mc Moscovium 295	576 Lv Livermorium 296	578 Ts Tennessine 297	580 Og Oganesson 298	581 Nh Nihonium 299	582 Fl Flerovium 300	584 Mc Moscovium 301	586 Lv Livermorium 302	588 Ts Tennessine 303	590 Og Oganesson 304	591 Nh Nihonium 305	592 Fl Flerovium 306	594 Mc Moscovium 307	596 Lv Livermorium 308	598 Ts Tennessine 309	600 Og Oganesson 310	601 Nh Nihonium 311	602 Fl Flerovium 312	604 Mc Moscovium 313	606 Lv Livermorium 314	608 Ts Tennessine 315	610 Og Oganesson 316	611 Nh Nihonium 317	612 Fl Flerovium 318	614 Mc Moscovium 319	616 Lv Livermorium 320	618 Ts Tennessine 321	620 Og Oganesson 322	621 Nh Nihonium 323	622 Fl Flerovium 324	624 Mc Moscovium 325	626 Lv Livermorium 326	628 Ts Tennessine 327	630 Og Oganesson 328	631 Nh Nihonium 329	632 Fl Flerovium 330	634 Mc Moscovium 331	636 Lv Livermorium 332	638 Ts Tennessine 333	640 Og Oganesson 334	641 Nh Nihonium 335	642 Fl Flerovium 336	644 Mc Moscovium 337	646 Lv Livermorium 338	648 Ts Tennessine 339	650 Og Oganesson 340	651 Nh Nihonium 341	652 Fl Flerovium 342	654 Mc Moscovium 343	656 Lv Livermorium 344	658 Ts Tennessine 345	660 Og Oganesson 346	661 Nh Nihonium 347	662 Fl Flerovium 348	664 Mc Moscovium 349	666 Lv Livermorium 350	668 Ts Tennessine 351	670 Og Oganesson 352	671 Nh Nihonium 353	672 Fl Flerovium 354	674 Mc Moscovium 355	676 Lv Livermorium 356	678 Ts Tennessine 357	680 Og Oganesson 358	681 Nh Nihonium 359	682 Fl Flerovium 360	684 Mc Moscovium 361	686 Lv Livermorium 362	688 Ts Tennessine 363	690 Og Oganesson 364	691 Nh Nihonium 365	692 Fl Flerovium 366	694 Mc Moscovium 367	696 Lv 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Mc Moscovium 415	776 Lv Livermorium 416	778 Ts Tennessine 417	780 Og Oganesson 418	781 Nh Nihonium 419	782 Fl Flerovium 420	784 Mc Moscovium 421	786 Lv Livermorium 422	788 Ts Tennessine 423	790 Og Oganesson 424	791 Nh Nihonium 425	792 Fl Flerovium 426	794 Mc Moscovium 427	796 Lv Livermorium 428	798 Ts Tennessine 429	800 Og Oganesson 430	801 Nh Nihonium 431	802 Fl Flerovium 432	804 Mc Moscovium 433	806 Lv Livermorium 434	808 Ts Tennessine 435	810 Og Oganesson 436	811 Nh Nihonium 437	812 Fl Flerovium 438	814 Mc Moscovium 439	816 Lv Livermorium 440	818 Ts Tennessine 441	820 Og Oganesson 442	821 Nh Nihonium 443	822 Fl Flerovium 444	824 Mc Moscovium 445	826 Lv Livermorium 446	828 Ts Tennessine 447	830 Og Oganesson 448	831 Nh Nihonium 449	832 Fl Flerovium 450	834 Mc Moscovium 451	836 Lv Livermorium 452	838 Ts Tennessine 453	840 Og Oganesson 454	841 Nh Nihonium 455	842 Fl Flerovium 456	844 Mc Moscovium 457	846 Lv Livermorium 458	848 Ts Tennessine 459	850 Og Oganesson 460	851 Nh Nihonium 461	852 Fl Flerovium 462	854 Mc Moscovium 463	856 Lv Livermorium 464	858 Ts Tennessine 465	860 Og Oganesson 466	861 Nh Nihonium 467	862 Fl Flerovium 468	864 Mc Moscovium 469	866 Lv Livermorium 470	868 Ts Tennessine 471	870 Og Oganesson 472	871 Nh Nihonium 473	872 Fl Flerovium 474	874 Mc Moscovium 475	876 Lv Livermorium 476	878 Ts Tennessine 477	880 Og Oganesson 478	881 Nh Nihonium 479	882 Fl Flerovium 480	884 Mc Moscovium 481	886 Lv Livermorium 482	888 Ts Tennessine 483	890 Og Oganesson 484	891 Nh Nihonium 485	892 Fl Flerovium 486	894 Mc Moscovium 487	896 Lv Livermorium 488	898 Ts Tennessine 489	900 Og Oganesson 490	901 Nh Nihonium 491	902 Fl Flerovium 492	904 Mc Moscovium 493	906 Lv Livermorium 494	908 Ts Tennessine 495	910 Og Oganesson 496	911 Nh Nihonium 497	912 Fl Flerovium 498	914 Mc Moscovium 499	916 Lv Livermorium 500	918 Ts Tennessine 501	920 Og Oganesson 502	921 Nh Nihonium 503	922 Fl Flerovium 504	924 Mc Moscovium 505	926 Lv Livermorium 506	928 Ts Tennessine 507	930 Og Oganesson 508	931 Nh Nihonium 509	932 Fl Flerovium 510	934 Mc Moscovium 511	936 Lv Livermorium 512	938 Ts Tennessine 513	940 Og Oganesson 514	941 Nh Nihonium 515	942 Fl Flerovium 516	944 Mc Moscovium 517	946 Lv Livermorium 518	948 Ts Tennessine 519	950 Og Oganesson 520	951 Nh Nihonium 521	952 Fl Flerovium 522	954 Mc Moscovium 523	956 Lv Livermorium 524	958 Ts Tennessine 525	960 Og Oganesson 526	961 Nh Nihonium 527	962 Fl Flerovium 528	964 Mc Moscovium 529	966 Lv Livermorium 530	968 Ts Tennessine 531	970 Og Oganesson 532	971 Nh Nihonium 533	972 Fl Flerovium 534	974 Mc Moscovium 535	976 Lv Livermorium 536	978 Ts Tennessine 537	980 Og Oganesson 538	981 Nh Nihonium 539	982 Fl Flerovium 540	984 Mc Moscovium 541	986 Lv Livermorium 542	988 Ts Tennessine 543	990 Og Oganesson 544	991 Nh Nihonium 545	992 Fl Flerovium 546	994 Mc Moscovium 547	996 Lv Livermorium 548	998 Ts Tennessine 549	1000 Og Oganesson 550	1001 Nh Nihonium 551	1002 Fl Flerovium 552	1004 Mc Moscovium 553	1006 Lv Livermorium 554	1008 Ts Tennessine 555	1010 Og Oganesson 556	1011 Nh Nihonium 557	1012 Fl Flerovium 558	1014 Mc Moscovium 559	1016 Lv Livermorium 560	1018 Ts Tennessine 561	1020 Og Oganesson 562	1021 Nh Nihonium 563	1022 Fl Flerovium 564	1024 Mc Moscovium 565	1026 Lv Livermorium 566	1028 Ts Tennessine 567	1030 Og Oganesson 568	1031 Nh Nihonium 569	1032 Fl Flerovium 570	1034 Mc Moscovium 571	1036 Lv Livermorium 572	1038 Ts Tennessine 573	1040 Og Oganesson 574	1041 Nh Nihonium 575	1042 Fl Flerovium 576	1044 Mc Moscovium 577	1046 Lv Livermorium 578	1048 Ts Tennessine 579	1050 Og Oganesson 580	1051 Nh Nihonium 581	1052 Fl Flerovium 582	1054 Mc Moscovium 583	1056 Lv Livermorium 584	1058 Ts Tennessine 585	1060 Og Oganesson 586	1061 Nh Nihonium 587	1062 Fl Flerovium 588	1064 Mc Moscovium 589	1066 Lv Livermorium 590	1068 Ts Tennessine 591	1070 Og Oganesson 592

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