2

L2-CHEMMR





# Te Mātauranga Matū, Kaupae 2, 2019

2.00 i te ahiahi Rāhina 11 Whiringa-ā-rangi 2019

## **PUKAPUKA RAUEMI**

Tirohia tēnei pukapuka hei whakatutuki i ngā tūmahi o ō Pukapuka Tūmahi, Tuhinga hoki.

Tirohia mēnā e tika ana te raupapatanga o ngā whārangi 2–5 kei roto i tēnei pukapuka, ka mutu, kāore tētahi o aua whārangi i te takoto kau.

KA TAEA TĒNEI PUKAPUKA TE PUPURI HEI TE MUTUNGA O TE WHAKAMĀTAUTAU.

Ngā tikanga tātai mō 91164M: Te whakaatu māramatanga ki te honohono, te hanga, ngā āhuatanga me ngā huringa pūngao

$$n = cV$$

$$n = \frac{m}{M}$$

Ngā tikanga tātai mō 91166M: *Te whakaatu māramatanga ki te tauhohehohe matū* 

$$K_{\rm w} = [H_3 O^+][OH^-] = 1 \times 10^{-14} \text{ i te } 25^{\circ}\text{C}$$

$$pH = -\log[H_3O^+] \qquad [H_3O^+] = 10^{-pH}$$

Formulae for 91164: Demonstrate understanding of bonding, structure, properties and energy changes

$$n = cV$$

$$n = \frac{m}{M}$$

Formulae for 91166: Demonstrate understanding of chemical reactivity

$$K_{\rm w} = [H_3 O^+][OH^-] = 1 \times 10^{-14} \text{ at } 25^{\circ}C$$

$$pH = -log[H_3O^+]$$
  $[H_3O^+] = 10^{-pH}$ 

# **TE TAKA PŪMOTU**

<i>18</i> <b>He</b> 4.0	2	20.2		Ar	40.0		Kr	83.8		Xe	131		Rn	222	~	Og	
4	10		18			36			54			98	_		118		
17	9	19.0	17	C	35.5	35	Br	79.9	53		127	85	At	210	117	L	
16	∞	16.0	16	S	32.1	34	Se	79.0	52	Te	128	84	Po	210	116	Lv	
15	<b>Z</b>	14.0	15	Ь	31.0	33	As	74.9	51	$\mathbf{S}\mathbf{p}$	122	83	Bi	209	115	Mc	
14	9	12.0	14	Si	28.1	32	Ge	72.6	50	Sn	119	82	Pb	207	114	F	
13	5 10	10.8	13	Al	27.0	31	Са	69.7	49	In	115	81	П	204	113	$^{ m N}$	
					12	30	Zn	65.4	48	Cd	112	80	Hg	201	112	Cn	277
					II	29	Cu	63.6	47	Ag	108	79	Au	197	1111	Rg	272
gota/					0I	28	Z	58.7	46	Pd	106	78	Pt	195	110	Ds	271
Papatipu Rāpoi Ngota/ g mol <sup>-1</sup>					6	27	Co	58.9	45	Rh	103	77	Ir	192	109	Mt	268
Papatipu g mol <sup>-1</sup>					8	26	Fe	55.9	44	Ru	101	92	Os	190	108	Hs	265
1 <b>H</b> 1.0					_	25	Mn	54.9	43	Tc	6.86	75	Re	186	107	Bh	264
Tau Iraoho					9	24	$C_{\mathbf{r}}$	52.0	42		95.9	74	*	184	106	S	263
Tac					5	23	>	50.9	41	$^{\mathrm{q}}$	92.9	73	La	181	105	Db	262
					4	22	Ţ	47.9	40	$\mathbf{Zr}$	91.2	72	Hf	179	104	Rf	261
					3	21	Sc	45.0	39	Y	88.9	71	Lu	175	103	Lr	262
Q	4 <b>B</b> o	9.0	12	Mg	24.3	20	Ca	40.1	38	$\mathbf{Sr}$	87.6	56	Ba	137	88	Ra	226
<i>F</i>	3	6.9	11	Na	23.0	19	K	39.1		Rb	85.5	55	C	133	87	Fr	223

	57	28	59	09	61	62	63	64	65	99	29	89	69	70
Te Raupapa	La	Ce	Pr	Nd	Pm	Sm	Eu	Сd	$\Gamma$	Dy	Ho	Er	Tm	ΛP
Lanthanide	139	140	141	144	147	150	152	157	159	163	165	167	169	173
	68	06	91	92	93	94	95	96	26	86	66	100	101	102
Te Raupapa	Ac	$\mathbf{L}\mathbf{h}$	Pa	Ω	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No
Actinide	227	232	231	238	237	239	241	244	249	251	252	257	258	259

# PERIODIC TABLE OF THE ELEMENTS

18 <b>He</b> 4.0	10 Ne 20.2	18 Ar	40.0	36	Kr	83.8	54	Xe	131	98	Rn	222	118	Og	
17	F 19.0		35.5		Br	6.62		I	127		At	210	117   1	S	
91	9 0 16.0	S 17		35	Se	0.62	53	Te	128	85	Po	210	116 1.	Lv	
15	8 <b>X</b> 14.0	=	31.0	34	As		52	Sb	122	84				Mc	
I	7	111		33		74.9	51			83	Bi	209	115	_	
14	6 C 12.0	14 Si	28.1	32	Ge	72.6	50	Sn	119	82	Pb	207	114	豆	
13	5 <b>B</b> 10.8	13 Al	27.0	31	Ga	69.7	49	In	115	81	I	204	113	Nh	
			12	30	Zn	65.4	48	Cd	112	08	Hg	201	112	$\mathbf{C}\mathbf{n}$	277
			II	29	$\mathbf{C}\mathbf{n}$	63.6	47	$\mathbf{A}\mathbf{g}$	108	62	Au	197	1111	$R_{g}$	272
1 <u>-l</u> c			0I	28	Z	58.7	46	Pd	106	78	Pt	195	110	Ds	271
Molar mass/g mol <sup>-1</sup>			6	27	Co	58.9	45	Rh	103	77	Ir	192	109	Mt	268
Molar m			8	26	Fe	55.9	44	Ru	101	92	Os	190	108	Hs	265
1 <b>H</b> 1.0			7	25	Mn	54.9	43	Tc	6.86	75	Re	186	107	Bh	264
number [			9	24	Cr	52.0	42	Mo	95.9	74	*	184	106	S	263
Atomic number			5	23	>	50.9	41	<b>N</b>	92.9	73	Га	181	105	Db	262
			4	22	Ţ	47.9	40	$\mathbf{Zr}$	91.2	72	Hf	179	104	Rf	261
			3	21	Sc	45.0	39	Y	6.88	71	Lu	175	103	Lr	262
2	4 <b>Be</b> 9.0	12 <b>Mg</b>	24.3	20	Ca	40.1	38	Sr	9.78	99	Ba	137	88	Ra	226
٢	3 Li 6.9	11 Na	23.0	19	¥	39.1		Rb	85.5	55	Cs	133	87	Fr	223

70	Vb	173	102	No	259
69	Tm	169	101	Md	258
89	Er	167	100	Fm	257
29	$H_0$	165	66	Es	252
99	Dy	163	86	Cf	251
65	$\mathbf{T}\mathbf{b}$	159	26	Bk	249
64	P <sub>S</sub>	157	96	Cm	244
63	Eu	152	95	Am	241
62	Sm	150	94	Pu	239
61	Pm	147	93	Np	237
09	Nd	144	92	Ω	238
59	Pr	141	91	Pa	231
28	Ce	140	06	Th	227 232
57	La	139	68	Ac	227
	de	Series		Actinide	Series

## English translation of the wording on the front cover

# Level 2 Chemistry, 2019

2.00 p.m. Monday 11 November 2019

## RESOURCE BOOKLET

Refer to this booklet to answer the questions in your Question and Answer Booklets.

Check that this booklet has pages 2–5 in the correct order and that none of these pages is blank.

YOU MAY KEEP THIS BOOKLET AT THE END OF THE EXAMINATION.