

L3-CHEMMR



NEW ZEALAND QUALIFICATIONS AUTHORITY
MANA TOHU MĀTAURANGA O AOTEAROA

QUALIFY FOR THE FUTURE WORLD
KIA NOHO TAKATŪ KI TŌ ĀMUA AO!

Te Mātauranga Matū, Kaupae 3, 2018

2.00i te ahiahi Rāpare 15 Whiringa-ā-rangi 2018

PUKAPUKA RAUEMI

Tirohia tēnei pukapuka hei whakatutuki i ngā tūmahi o ō Pukapuka Tūmahi, Tuhiinga 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 91390M: Te whakaatu māramatanga ki ngā tikanga matūrewarau me ngā āhuatanga o ngā korakora me ngā matū

$$n = cV$$

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

$$q = mc\Delta T$$

$$\Delta_r H^\circ = \sum \Delta_f H^\circ(\text{ngā hua}) - \sum \Delta_f H^\circ(\text{ngā pūmatū hohe})$$

Ngā tikanga tātai mō 91392M: Te whakaatu māramatanga ki ngā mātāpono taurite i ngā pūnaha waiwai

$$\text{pH} = -\log[\text{H}_3\text{O}^+] \qquad [\text{H}_3\text{O}^+] = 10^{-\text{pH}}$$

$$K_w = [\text{H}_3\text{O}^+][\text{OH}^-] = 1 \times 10^{-14} \text{ i te } 25^\circ\text{C}$$

$$\text{p}K_a = -\log K_a \qquad K_a = 10^{-\text{p}K_a}$$

$$K_a = \frac{[\text{H}_3\text{O}^+][\text{A}^-]}{[\text{HA}]}$$

$$K_s = s^2 \qquad K_s = 4s^3$$

$$n = cV$$

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

Formulae for 91390: *Demonstrate understanding of thermochemical principles and the properties of particles and substances*

$$n = cV$$

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

$$q = mc\Delta T$$

$$\Delta_r H^\circ = \sum \Delta_f H^\circ(\text{products}) - \sum \Delta_f H^\circ(\text{reactants})$$

Formulae for 91392: *Demonstrate understanding of equilibrium principles in aqueous systems*

$$\text{pH} = -\log[\text{H}_3\text{O}^+]$$

$$[\text{H}_3\text{O}^+] = 10^{-\text{pH}}$$

$$K_w = [\text{H}_3\text{O}^+][\text{OH}^-] = 1 \times 10^{-14} \text{ at } 25^\circ\text{C}$$

$$\text{p}K_a = -\log K_a$$

$$K_a = 10^{-\text{p}K_a}$$

$$K_a = \frac{[\text{H}_3\text{O}^+][\text{A}^-]}{[\text{HA}]}$$

$$K_s = s^2$$

$$K_s = 4s^3$$

$$n = cV$$

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

TE TAKA PŪMOTU

		Tau Iraoho		Papatipu ngota hāngai																	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18		
3	Li 6.9	4	Be 9.0	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	2	He 4.0
11	Na 23.0	12	Mg 24.3	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	10	Ne 20.2
19	K 39.1	20	Ca 40.1	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	13	Al 13
37	Rb 85.5	38	Sr 87.6	88.9	91.2	92.9	95.9	98.9	101	103	106	108	112	115	119	122	128	127	131	17	Cl 35.5
55	Cs 133	56	Ba 137	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	13	P 31.0
87	Fr 223	88	Ra 226	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	14	Si 28.1
				103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	15	P 31.0
				103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	16	S 32.1
				103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	17	Cl 35.5

57	Lanthanide Raupapa Lanthanide	58	Ce 140	59	Pr 141	60	Nd 144	61	Pm 147	62	Sm 150	63	Eu 152	64	Gd 157	65	Tb 159	66	Dy 163	67	Ho 165	68	Er 167	69	Tm 169	70	Yb 173
89	Actinide Raupapa Actinide	90	Th 232	91	Pa 231	92	U 238	93	Np 237	94	Pu 239	95	Am 241	96	Cm 244	97	Bk 249	98	Cf 251	99	Es 252	100	Fm 257	101	Md 258	102	No 259

PERIODIC TABLE OF THE ELEMENTS

18

Atomic number		Relative atomic mass																				
	1																					
	H 1.0																				He 4.0	
3	Li 6.9	Be 9.0																				
11	Na 23.0	Mg 24.3																				
19	K 39.1	Ca 40.1	Sc 45.0	Ti 47.9	V 50.9	Cr 52.0	Mn 54.9	Fe 55.9	Co 58.9	Ni 58.7	Cu 63.6	Zn 65.4	Ga 69.7	Ge 72.6	As 74.9	Se 79.0	Br 79.9	Kr 83.8				
37	Rb 85.5	Sr 87.6	Y 88.9	Zr 91.2	Nb 92.9	Mo 95.9	Tc 98.9	Ru 101	Rh 103	Pd 106	Ag 108	Cd 112	In 115	Sn 119	Sb 122	Te 128	I 127	Xe 131				
55	Cs 133	Ba 137	Lu 175	Hf 179	Ta 181	W 184	Re 186	Os 190	Ir 192	Pt 195	Au 197	Hg 201	Tl 204	Pb 207	Bi 209	Po 210	At 210	Rn 222				
87	Fr 223	Ra 226	Lr 262	Rf 261	Db 262	Sg 263	Bh 264	Hs 265	Mt 268	Ds 271	Rg 272	Cn 277	Nh 113	Fl 114	Mc 115	Lv 116	Ts 117	Og 118				

Lanthanide Series	57	La 139	Ce 140	Pr 141	Nd 144	Pm 147	Sm 150	Eu 152	Gd 157	Tb 159	Dy 163	Ho 165	Er 167	Tm 169	Yb 173
Actinide Series	89	Ac 227	Th 232	Pa 231	U 238	Np 237	Pu 239	Am 241	Cm 244	Bk 249	Cf 251	Es 252	Fm 257	Md 258	No 259

English translation of the wording on the front cover

L3-CHEMMR

Level 3 Chemistry, 2018

2.00 p.m. Thursday 15 November 2018

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.