

Tirohia te uhi o muri e kitea ai te
whakapākehātanga o tēnei uhi

2

L2-CHEMMR



992108



Mana Tohu Mātauranga o Aotearoa
New Zealand Qualifications Authority

Te Mātai Matū, Kaupae 2, 2025

TE PUKAPUKA RAUEMI

Tirohia tēnei pukapuka hei whakaoti i ngā tūmahi kei ō Pukapuka mō ngā Tūmahi me ngā Tuhinga.

Tirohia kia kitea ai 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.

E ĀHEI ANA TŌ PUPURI KI TĒNEI PUKAPUKA HEI TE MUTUNGA O TE WHAKAMĀTAUTAU.

Ngā ture tātai mō 91164: *Te whakaatu māramatanga ki te honohono, ki te hanga, ki ngā āhuatanga me ngā panonitanga o te ngao*

$$n = cV \quad \Delta_r H = \sum \begin{array}{c} \text{ngā ngao honohono} \\ \text{(ngā hononga i motukia)} \end{array} - \sum \begin{array}{c} \text{ngā ngao honohono} \\ \text{(ngā hononga i hangaia)} \end{array}$$

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

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

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

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

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

$$n = cV \quad \Delta_r H = \Sigma \text{ bond energies (bonds broken)} - \Sigma \text{ bond energies (bonds formed)}$$

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

Formulae for 91166: *Demonstrate understanding of chemical reactivity*

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

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

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

TE TAKA PŪMOTU

Te tau iraohohi																		Te papatipu Molar/g mol ⁻¹																		18																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
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Te Raupapa <i>Lanthanide</i>	57	La 139	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	Ac 227	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

Atomic number																		Molar mass/g mol ⁻¹																		18																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
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Lanthanide Series	57	La	139	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	Ac	227	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

English translation of the wording on the front cover



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Level 2 Chemistry 2025

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 neither of these pages is blank.

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