

L3-CHEMR



NEW ZEALAND QUALIFICATIONS AUTHORITY  
MANA TOHU MĀTAURANGA O AOTEAROA

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

## 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 2–3 in the correct order and that none of these pages is blank.

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

**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***

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

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

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

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

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

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

$$K_s = s^2$$

$$K_s = 4s^3$$

$$n = cV$$

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

# PERIODIC TABLE OF THE ELEMENTS

Atomic number																		1 <b>H</b> 1.0	18																																																						
Relative atomic mass																																																																									
1	2																13	14	15	16	17	18																																																			
3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20																																																								
<b>Li</b> 6.9	<b>Be</b> 9.0	<b>Na</b> 23.0	<b>Mg</b> 24.3	<b>K</b> 39.1	<b>Ca</b> 40.1	<b>Sc</b> 45.0	<b>Ti</b> 47.9	<b>V</b> 50.9	<b>Cr</b> 52.0	<b>Mn</b> 54.9	<b>Fe</b> 55.9	<b>Co</b> 58.9	<b>Ni</b> 58.7	<b>Cu</b> 63.6	<b>Zn</b> 65.4	<b>Ga</b> 69.7	<b>Ge</b> 72.6	<b>As</b> 74.9	<b>Se</b> 79.0	<b>Br</b> 79.9	<b>Kr</b> 83.8	<b>Rb</b> 85.5	<b>Sr</b> 87.6	<b>Y</b> 88.9	<b>Zr</b> 91.2	<b>Nb</b> 92.9	<b>Mo</b> 95.9	<b>Tc</b> 98.9	<b>Ru</b> 101	<b>Rh</b> 103	<b>Pd</b> 106	<b>Ag</b> 108	<b>Cd</b> 112	<b>In</b> 115	<b>Sn</b> 119	<b>Sb</b> 122	<b>Te</b> 128	<b>I</b> 127	<b>Xe</b> 131	<b>Cs</b> 133	<b>Ba</b> 137	<b>Lu</b> 175	<b>Hf</b> 179	<b>Ta</b> 181	<b>W</b> 184	<b>Re</b> 186	<b>Os</b> 190	<b>Ir</b> 192	<b>Pt</b> 195	<b>Au</b> 197	<b>Hg</b> 201	<b>Tl</b> 204	<b>Pb</b> 207	<b>Bi</b> 209	<b>Po</b> 210	<b>At</b> 210	<b>Rn</b> 222	<b>Fr</b> 223	<b>Ra</b> 226	<b>Lr</b> 262	<b>Rf</b> 261	<b>Db</b> 262	<b>Sg</b> 263	<b>Bh</b> 264	<b>Ds</b> 271	<b>Rg</b> 272	<b>Cn</b> 277	<b>Nh</b> 113	<b>Fl</b> 114	<b>Mc</b> 115	<b>Lv</b> 116	<b>Ts</b> 117	<b>Og</b> 118

57	58	59	60	61	62	63	64	65	66	67	68	69	70
<b>La</b> 139	<b>Ce</b> 140	<b>Pr</b> 141	<b>Nd</b> 144	<b>Pm</b> 147	<b>Sm</b> 150	<b>Eu</b> 152	<b>Gd</b> 157	<b>Tb</b> 159	<b>Dy</b> 163	<b>Ho</b> 165	<b>Er</b> 167	<b>Tm</b> 169	<b>Yb</b> 173
89	90	91	92	93	94	95	96	97	98	99	100	101	102
<b>Ac</b> 227	<b>Th</b> 232	<b>Pa</b> 231	<b>U</b> 238	<b>Np</b> 237	<b>Pu</b> 239	<b>Am</b> 241	<b>Cm</b> 244	<b>Bk</b> 249	<b>Cf</b> 251	<b>Es</b> 252	<b>Fm</b> 257	<b>Md</b> 258	<b>No</b> 259
Lanthanide Series													
Actinide Series													

