

L1-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 1, 2017

9.30 i te ata Rātū 14 Whiringa-ā-rangi 2017

**PUKAPUKA RAUEMI**  
**mō 90933M me 90934M**

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.**

### Raupapatanga hohe

|    |    |    |    |    |    |     |    |    |
|----|----|----|----|----|----|-----|----|----|
| Ca | Mg | Al | Zn | Fe | Pb | (H) | Cu | Ag |
|----|----|----|----|----|----|-----|----|----|

### Ngā ture mō te mehamehanga

|  |  |
|--|--|
| ngā pākawa ota, $\text{NO}_3^-$          | <b>Ka memeha</b> te katoa  |
| ngā pūhaumāota, $\text{Cl}^-$            | <b>Ka memeha</b> te katoa, hāunga te $\text{AgCl}$ , $\text{PbCl}_2$                     |
| ngā kahautawa, $\text{I}^-$              | <b>Ka memeha</b> te katoa, hāunga te $\text{AgI}$ , $\text{PbI}_2$                       |
| ngā pākawa pungatara, $\text{SO}_4^{2-}$ | <b>Ka memeha</b> te katoa, hāunga te $\text{BaSO}_4$ , $\text{PbSO}_4$ , $\text{CaSO}_4$ |
| ngā waihā, $\text{OH}^-$                 | <b>Ka memeha</b> te katoa, hāunga te $\text{KOH}$ , $\text{NaOH}$                        |
| ngā pākawa waro, $\text{CO}_3^{2-}$      | <b>Ka memeha</b> te katoa, hāunga te $\text{K}_2\text{CO}_3$ , $\text{Na}_2\text{CO}_3$  |

### Taka katote

| +1              | +2               | +3               | -3 | -2                 | -1               |
|-----------------|------------------|------------------|----|--------------------|------------------|
| $\text{NH}_4^+$ | $\text{Ca}^{2+}$ | $\text{Al}^{3+}$ |    | $\text{O}^{2-}$    | $\text{OH}^-$    |
| $\text{Na}^+$   | $\text{Mg}^{2+}$ | $\text{Fe}^{3+}$ |    | $\text{S}^{2-}$    | $\text{Cl}^-$    |
| $\text{K}^+$    | $\text{Cu}^{2+}$ |                  |    | $\text{CO}_3^{2-}$ | $\text{I}^-$     |
| $\text{Ag}^+$   | $\text{Pb}^{2+}$ |                  |    | $\text{SO}_4^{2-}$ | $\text{NO}_3^-$  |
| $\text{H}^+$    | $\text{Fe}^{2+}$ |                  |    |                    | $\text{HCO}_3^-$ |
| $\text{Li}^+$   | $\text{Ba}^{2+}$ |                  |    |                    | $\text{F}^-$     |
|                 | $\text{Zn}^{2+}$ |                  |    |                    |                  |

### Activity series

|    |    |    |    |    |    |     |    |    |
|----|----|----|----|----|----|-----|----|----|
| Ca | Mg | Al | Zn | Fe | Pb | (H) | Cu | Ag |
|----|----|----|----|----|----|-----|----|----|

### Solubility rules

|                                |  |
|--------------------------------|--|
| nitrates, $\text{NO}_3^-$      | All <b>soluble</b>   |
| chlorides, $\text{Cl}^-$       | All <b>soluble</b> except $\text{AgCl}$ , $\text{PbCl}_2$                      |
| iodides, $\text{I}^-$          | All <b>soluble</b> except $\text{AgI}$ , $\text{PbI}_2$                        |
| sulfates, $\text{SO}_4^{2-}$   | All <b>soluble</b> except $\text{BaSO}_4$ , $\text{PbSO}_4$ , $\text{CaSO}_4$  |
| hydroxides, $\text{OH}^-$      | All <b>insoluble</b> except $\text{KOH}$ , $\text{NaOH}$                       |
| carbonates, $\text{CO}_3^{2-}$ | All <b>insoluble</b> except $\text{K}_2\text{CO}_3$ , $\text{Na}_2\text{CO}_3$ |

### Table of ions

| +1              | +2               | +3               | -3 | -2                 | -1               |
|-----------------|------------------|------------------|----|--------------------|------------------|
| $\text{NH}_4^+$ | $\text{Ca}^{2+}$ | $\text{Al}^{3+}$ |    | $\text{O}^{2-}$    | $\text{OH}^-$    |
| $\text{Na}^+$   | $\text{Mg}^{2+}$ | $\text{Fe}^{3+}$ |    | $\text{S}^{2-}$    | $\text{Cl}^-$    |
| $\text{K}^+$    | $\text{Cu}^{2+}$ |                  |    | $\text{CO}_3^{2-}$ | $\text{I}^-$     |
| $\text{Ag}^+$   | $\text{Pb}^{2+}$ |                  |    | $\text{SO}_4^{2-}$ | $\text{NO}_3^-$  |
| $\text{H}^+$    | $\text{Fe}^{2+}$ |                  |    |                    | $\text{HCO}_3^-$ |
| $\text{Li}^+$   | $\text{Ba}^{2+}$ |                  |    |                    | $\text{F}^-$     |
|                 | $\text{Zn}^{2+}$ |                  |    |                    |                  |

TE TAKA PŪMOTU

|    |    |            |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|----|----|------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
|    |    | Tau Iraoho |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 18 |    |
|    |    | 1          |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 2  |    |
|    |    | H          |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | He |    |
| 1  | 2  |            |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 17 |    |
| 3  | 4  | Be         |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 8  | 10 |
| 11 | 12 | Mg         |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 9  | Ne |
| 19 | 20 | K          | Ca |    |    |    |    |    |    |    |    |    |    |    |    |    | 16 | 17 | 18 |
| 37 | 38 | Rb         | Sr | Y  | Zr | Nb | Mo | Tc | Ru | Os | Ir | Pt | Au | Hg | Cd | In | Sn | Te | I  |
| 55 | 56 | Cs         | Ba | Lu | Hf | Ta | W  | Re | Os | Ir | Pt | Au | Hg | Cd | In | Sn | Te | I  | Xe |
| 87 | 88 | Fr         | Ra | Lr | Rf | Db | Sg | Bh | Hs | Mt | Ds | Rg | Cn | Nh | Fl | Mc | Lv | Ts | Og |

|    |    |    |    |    |    |    |    |    |    |    |     |     |     |
|----|----|----|----|----|----|----|----|----|----|----|-----|-----|-----|
| 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68  | 69  | 70  |
| La | Ce | Pr | Nd | Pm | Sm | Eu | Gd | Tb | Dy | Ho | Er  | Tm  | Yb  |
| 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 | 101 | 102 |
| Ac | Th | Pa | U  | Np | Pu | Am | Cm | Bk | Cf | Es | Fm  | Md  | No  |

PERIODIC TABLE OF THE ELEMENTS

| Atomic number |    |    |    |     |    |     |    |     |    |     |    |     |    |     |    |     |    | 1<br>H |    |     |    |     |    |     |    |     |    |     |    |     |    |     |    |     |    |
|---------------|----|----|----|-----|----|-----|----|-----|----|-----|----|-----|----|-----|----|-----|----|--------|----|-----|----|-----|----|-----|----|-----|----|-----|----|-----|----|-----|----|-----|----|
| 1             |    |    | 2  |     | 3  |     |    |     |    |     |    |     |    |     |    |     |    | 4      |    |     |    |     |    |     |    |     |    |     |    |     |    |     |    |     |    |
| 3             | Li | 4  | Be |     |    |     |    |     |    |     |    |     |    |     |    |     |    | 5      | B  | 6   | C  | 7   | N  | 8   | O  | 9   | F  | 10  | Ne |     |    |     |    |     |    |
| 11            | Na | 12 | Mg |     |    |     |    |     |    |     |    |     |    |     |    |     |    | 13     | Al | 14  | Si | 15  | P  | 16  | S  | 17  | Cl | 18  | Ar |     |    |     |    |     |    |
| 19            | K  | 20 | Ca | 21  | Sc | 22  | Ti | 23  | V  | 24  | Cr | 25  | Mn | 26  | Fe | 27  | Co | 28     | Ni | 29  | Cu | 30  | Zn | 31  | Ga | 32  | Ge | 33  | As | 34  | Se | 35  | Br | 36  | Kr |
| 37            | Rb | 38 | Sr | 39  | Y  | 40  | Zr | 41  | Nb | 42  | Mo | 43  | Tc | 44  | Ru | 45  | Rh | 46     | Pd | 47  | Ag | 48  | Cd | 49  | In | 50  | Sn | 51  | Sb | 52  | Te | 53  | I  | 54  | Xe |
| 55            | Cs | 56 | Ba | 71  | Lu | 72  | Hf | 73  | Ta | 74  | W  | 75  | Re | 76  | Os | 77  | Ir | 78     | Pt | 79  | Au | 80  | Hg | 81  | Tl | 82  | Pb | 83  | Bi | 84  | Po | 85  | At | 86  | Rn |
| 87            | Fr | 88 | Ra | 103 | Lr | 104 | Rf | 105 | Db | 106 | Sg | 107 | Bh | 108 | Hs | 109 | Mt | 110    | Ds | 111 | Rg | 112 | Cn | 113 | Nh | 114 | Fl | 115 | Mc | 116 | Lv | 117 | Ts | 118 | Og |

|    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |     |    |     |    |     |    |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-----|----|-----|----|-----|----|
| 57 | 58 | La | Ce | 59 | Pr | Nd | 60 | Pm | 61 | 62 | Sm | 63 | Eu | 64 | Gd | 65 | Tb | 66 | Dy | 67 | Ho | 68  | Er | 69  | Tm | 70  | Yb |
| 89 | 90 | Ac | Th | 91 | Pa | U  | 92 | Np | 93 | 94 | Pu | 95 | Am | 96 | Cm | 97 | Bk | 98 | Cf | 99 | Es | 100 | Fm | 101 | Md | 102 | No |





*English translation of the wording on the front cover*

L1-CHEMMR

## Level 1 Chemistry, 2017

9.30 a.m. Tuesday 14 November 2017

### RESOURCE BOOKLET for 90933 and 90934

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.**