L3-CHEMMR

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Te Mātauranga Matū, Kaupae 3, 2014

2.00 i te ahiahi Rātū 11 Whiringa-ā-rangi 2014

PUKA RAUEMI MŌ 91390M, 91391M, 91392M

Tirohia tēnei puka hei whakautu i ngā pātai i roto i ō pukapuka Pātai, Whakautu hoki.

Tirohia mehemea kei roto nei ngā whārangi 2–3 e raupapa tika ana, ā, kāore hoki he whārangi wātea.

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

TE TAKA PŪMOTU

| <i>18</i> He 4.0 | Ne | 20.2 | Ar | 40.0 | | Kr | 83.8 | | Xe | 131 | | Rn | 222 | | | |
|-------------------------|----------------|------|--------------|------|----|----|------|----|----------------|------|----|------------|-----|------|------------|-----|
| 7 | 10 | + | 2 | | 36 | | | 54 | | | 98 | _ | | | | |
| 17 | 9 F | 19.0 | \mathbf{C} | 35.5 | 35 | Br | 79.9 | 53 | - | 127 | 85 | At | 210 | | | |
| 16 | 8 | 16.0 | 10 S | 32.1 | 34 | Se | 79.0 | 52 | Te | 128 | 84 | Po | 210 | 116 | Lv | 292 |
| 15 | Z | 14.0 | CI P | 31.0 | 33 | As | 74.9 | 51 | Sb | 122 | 83 | Bi | 209 | | | |
| 14 | O 9 | 12.0 | | 28.1 | 32 | Ge | 72.6 | 50 | Sn | 119 | 82 | Pb | 207 | 114 | F | 289 |
| 13 | 5 B | 10.8 | LS IA | 27.0 | 31 | Ga | 69.7 | 49 | In | 115 | 81 | П | 204 | | | |
| | | | | 12 | 30 | Zn | 65.4 | 48 | Cd | 112 | 80 | $_{ m Hg}$ | 201 | 112 | Cn | 277 |
| | | | | II | 29 | Cu | 63.5 | 47 | \mathbf{Ag} | 108 | 79 | Au | 197 | 1111 | $R_{ m g}$ | 272 |
| | | | | 0I | 28 | Z | 58.7 | 46 | Pd | 106 | 78 | Pt | 195 | 110 | Ds | 271 |
| Papatipu Ngota | | | | 6 | 27 | Co | 58.9 | 45 | Rh | 103 | 77 | Ir | 192 | 109 | Mt | 268 |
| Papatip | | | | 8 | 26 | Fe | 55.9 | 4 | Ru | 101 | 92 | Os | 190 | 108 | Hs | 265 |
| 1 H 1.0 | | | | 7 | 25 | Mn | 54.9 | 43 | Tc | 6.86 | 75 | Re | 186 | 107 | Bh | 264 |
| Tau Iraoho | | | | 9 | 24 | Cr | 52.0 | 42 | Mo | | 74 | * | 184 | 106 | So | 263 |
| Tau | | | | 5 | 23 | > | 50.9 | 41 | N _p | 92.9 | 73 | Та | 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 Be | 9.0 | Mg | 24.3 | 20 | Ca | 40.1 | 38 | Sr | 9.78 | 56 | Ba | 137 | 88 | Ra | 226 |
| I | 3 Li | 6.9 | Na | 23.0 | 19 | K | 39.1 | | Rb | 85.5 | 55 | Cs | 133 | 87 | Fr | 223 |

| | 57 | 58 | 59 | 09 | 61 | 62 | 63 | 64 | 65 | 99 | <i>L</i> 9 | 89 | 69 | 70 |
|----------|-----|-----|-----|-----|-----------------|---------------|-----|-----|------------------------|-----|------------|---------------|-----|-----|
|)a | La | Ce | Pr | PN | Pm | \mathbf{Sm} | Eu | РS | $\mathbf{T}\mathbf{p}$ | Dy | H_0 | \mathbf{Er} | Tm | ΛÞ |
| nthanide | 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 |
| aupapa | Ac | Th | Pa | Ω | $^{\mathrm{d}}$ | Pu | Am | Cm | Bķ | Cf | Es | Fm | Md | No |
| de | 227 | 232 | 231 | 238 | 237 | 239 | 241 | 244 | 249 | 251 | 252 | 257 | 258 | 259 |

PERIODIC TABLE OF THE ELEMENTS

| <i>18</i> He | 4.0 | | Ne | 20.2 | | Ar | 40.0 | | Kr | 83.8 | | Xe | 31 | | Rn | 222 | | | |
|---------------------------------------|----------------------|----|---------|------|----|----------|------|----|----------|------|----|------------------------|------|----|----------|-----|-----|----|-----|
| 1 2 H | 4 | 10 | | 7(| 18 | ₹ | | 36 | <u>×</u> | 83 | 54 | | 131 | 98 | ~ | 2. | | | |
| | 17 | 6 | | 19.0 | 17 | C | 35.5 | 35 | Br | 79.9 | 53 | Ι | 127 | 85 | At | 210 | | | |
| | 91 | 8 | 0 | 16.0 | 16 | S | 32.1 | 34 | Se | 79.0 | 52 | Te | 128 | 84 | P_0 | 210 | 116 | Lv | 292 |
| | 15 | 7 | Z | 14.0 | 15 | Ь | 31.0 | 33 | As | 74.9 | 51 | $\mathbf{S}\mathbf{b}$ | 122 | 83 | Bi | 209 | | | |
| | 14 | 9 | C | 12.0 | 14 | Si | 28.1 | 32 | Ge | 72.6 | 50 | Sn | 119 | 82 | Pb | 207 | 114 | E | 289 |
| | 13 | 5 | В | 10.8 | 13 | A | 27.0 | 31 | Са | 69.7 | 49 | In | 115 | 81 | П | 204 | | | |
| | 1 | | | | | | 12 | 30 | Zn | 65.4 | 48 | Cd | 112 | 80 | Hg | 201 | 112 | Cn | 277 |
| | | | | | | | II | 29 | Cu | 63.5 | 47 | Ag | 108 | 62 | Au | 197 | 111 | Rg | 272 |
| | nass | | | | | | 0I | 28 | Z | 58.7 | 46 | Pd | 106 | 78 | Pt | 195 | 110 | Ds | 271 |
| | Relative atomic mass | | | | | | 6 | 27 | Co | 58.9 | 45 | Rh | 103 | 77 | Ir | 192 | 109 | Mt | 268 |
| | Relative | | | | | | 8 | 26 | Fe | 55.9 | 44 | Ru | 101 | 92 | Os | 190 | 108 | Hs | 265 |
| 1 H | 1.0 | | | | | | 7 | 25 | Mn | 54.9 | 43 | Tc | 6.86 | 75 | Re | 186 | 107 | Bh | 264 |
| ımber | | | | | | | 9 | 24 | Cr | | | | 95.9 | | * | | 106 | S | 263 |
| Atomic number | | | | | | | 5 | 23 | > | 50.9 | 41 | qN | 92.9 | 73 | Та | 181 | 105 | Db | 262 |
| · · · · · · · · · · · · · · · · · · · | | | | | | | 4 | 22 | Ξ | 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 |
| | 2 | 4 | Be | 0.6 | 12 | Mg | 24.3 | 20 | Ca | 40.1 | 38 | Sr | 9.78 | 56 | Ba | 137 | 88 | Ra | 226 |
| | I | 3 | Li | 6.9 | 11 | Na | 23.0 | 19 | ¥ | 39.1 | | Rb | 85.5 | 55 | Cs | 133 | 87 | Fr | 223 |

| | 57 | 58 | 59 | 09 | 61 | 62 | 63 | 64 | 65 | 99 | 29 | 89 | 69 | 70 |
|------------|-----|------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-------|-----|-----|-----|
| Lanthanide | La | Ce | Pr | Nd | Pm | Sm | Eu | Сd | Tp | Dy | H_0 | Er | Tm | Yb |
| Series | 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 |
| Actinide | Ac | $\mathbf{T}\mathbf{h}$ | Pa | Ω | Np | Pu | Am | Cm | Bķ | Cf | Es | Fm | Md | No |
| Series | 227 | 232 | 231 | 238 | 237 | 239 | 241 | 244 | 249 | 251 | 252 | 257 | 258 | 259 |

English translation of the wording on the front cover

Level 3 Chemistry, 2014

2.00 pm Tuesday 11 November 2014

RESOURCE SHEET for 91390, 91391, 91392

Refer to this sheet 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 SHEET AT THE END OF THE EXAMINATION.