TABLE XV. DEBYE TEMPERATURES OBTAINED FROM SPECIFIC HEAT DATA ($\theta^S$) AND FROM THE LINDEMANN EQUATION ($\theta^M$)[a,b,c]

| Element | $\theta_0{}^{S}$[a] (°K) | Ref. | $\theta_{298}{}^{S}$[b] (°K) | Ref. | $\theta^{M}$[c] (°K) |
|---|---|---|---|---|---|
| 3 Li | 352 ±17 | 1, 2 | 448 | — | 476 |
| 4 Be | 1160 | 3 | 1031 | — | 1062 |
| 5 B | 1315[d] | 4 | 1362 | — | 1286 |
| 6 C(g) | 402 ±11 | 5, 6 | 1550[e] | — | 1471 |
| 6 C(d) | 2240 ±5 | 7 | 1874 | — | — |
| 11 Na | 157 ±1 | 1, 8–11 | 155 ±5 | 96, 97 | 193 |
| 12 Mg | 396 ±54 | 12–14 | 330 | — | 354 |
| 13 Al | 423 ±5 | 15, 16 | 390 | — | 378 |
| 14 Si | 647 ±11 | 17, 18 | 692 | — | 468 |
| 15 P(w) | (193)[f] | — | (576)[f] | — | 184 |
| 15 P(r) | (325)[f] | — | (800)[f] | — | 310 |
| 16 S(r) | 250[g] | 19 | 527 | 19 | 202 |
| 16 S(m) | (200)[f] | — | — | — | 191 |
| 19 K | 89.4 ±0.5 | 1, 11 | 100 | 96, 97 | 114 |
| 20 Ca | 234 ±5 | 20, 21 | 230 | 96, 97 | 246 |
| 21 Sc | 470 ±80 | 22 | (476)[f] | — | 356 |
| 22 Ti | 426 ±5[e] | 23–25 | 380 | 97 | 385 |
| 23 V | 326 ±54 | 23, 26–28 | 390 | 97 | 446 |
| 24 Cr | 598 ±32[e] | 23, 29, 30 | 424 | — | 460 |
| 25 Mn | 418 ±32 | 23, 31, 32 | 363 | — | 374 |
| 26 Fe | 457 ±12 | 33–35 | 373 | — | 410 |
| 27 Co | 452 ±17 | 35, 36, 37 | 386 | — | 402 |
| 28 Ni | 427 ±14 | 29, 38 | 345 | — | 401 |
| 29 Cu | 342 ±2[e] | 21, 25, 39–43 | 310 | — | 333 |
| 30 Zn | 316 ±20 | 44–48 | 237 ±3 | 96, 97 | 216 |
| 31 Ga | 317 | 46, 49 | 240 | 97 | 127 |
| 32 Ge | 378 ±22 | 18, 50, 51 | 403 | — | 237 |
| 33 As | (236)[f] | — | 275 | 98 | 225 |
| 34 Se | 151.7 ±0.4 | 52 | — | — | 136 |
| 35 Rb | 54 ±4 | 53, 54 | 59 | 99 | 69.1 |
| 38 Sr | 147 ±1 | 20 | 148 | 99 | 158 |
| 39 Y | 268 ±32 | 22, 55 | 214 | 100 | 229 |
| 40 Zr | 289 ±24 | 12, 23, 25 | 250 | 97 | 277 |
| 41 Nb | 241 ±13 | 55–57 | 260 | 55 | 340 |
| 42 Mo | 459 ±11 | 23, 55, 58–60 | 377 | — | 360 |
| 43 Tc | (351)[f] | — | (422)[f] | — | 335 |
| 44 Ru | 600 | 23 | 415 | — | 345 |
| 45 Rh | 480 ±32 | 23, 61, 62 | 350 | — | 319 |
| 46 Pd | 283 ±16 | 63–65 | 275 | 97 | 277 |
| 47 Ag | 228 ±3 | 39, 43, 65–68 | 221 | — | 216 |
| 48 Cd | 252 ±48[h] | 14, 69 | 221 | — | 135 |
| 49 In | 108.8 ±0.3 | 70, 71 | 129 | 97 | 107 |
| 50 Sn(g) | 236 ±24 | 50, 72 | 254 | — | 330 |



TABLE XV. DEBYE TEMPERATURES OBTAINED FROM SPECIFIC HEAT DATA ($\theta^S$) AND FROM THE LINDEMANN EQUATION ($\theta^M$)[a,b,c]—*Continued*

| Element | $\theta_0{}^{S}$[a] (°K) | Ref. | $\theta_{298}{}^{S}$[b] (°K) | Ref. | $\theta^{M}$[c] (°K) |
|---|---|---|---|---|---|
| 50 Sn(w) | 196 ±9 | 71, 73–75 | 170 | 97 | 356 |
| 51 Sb | (150)[f] | — | 200 | 97 | 143 |
| 52 Te | 141 ±12 | 52, 76 | — | — | 121 |
| 55 Cs | 40 ±5 | 53, 54 | 43 | 99 | 50.8 |
| 56 Ba | 110.5 ±1.8 | 20 | 116 | 99 | 111 |
| 57 La | 142 ±3 | 22 | 135 ±5 | 101 | 144 |
| 58 Ce(γ) | (146)[f] | — | 138 | 102 | 140 |
| 59 Pr | 85 ±1 | 77 | 138 | 103 | 147 |
| 60 Nd | (159)[f] | — | 148 ±8 | *i* | 152 |
| 61 Pm | (158)[f] | — | — | — | (151)[f] |
| 62 Sm | 116 | 77 | 148 ±4 | 101, 102 | 153 |
| 63 Eu | (127)[f] | — | — | — | 121 |
| 64 Gd | (170)[f] | — | 155 ±3 | 101, 104 | 162 |
| 65 Tb | 150 | 78 | 158 | 101 | 165 |
| 66 Dy | 172 ±35 | 77, 79 | 158 | 101 | 167 |
| 67 Ho | 114 ±7 | 77 | 161 | 101 | 169 |
| 68 Er | 134 ±10 | 77 | 163 | 101 | 171 |
| 69 Tm | 127 ±1 | 77 | 167 | 101 | 173 |
| 70 Yb | 118 | 80 | — | — | 120 |
| 71 Lu | 210 | 81 | 166 | 100, 101 | 176 |
| 72 Hf | 256 ±5 | 23, 25 | 213 | 99 | 240 |
| 73 Ta | 247 ±13 | 23, 26, 55, 82, 83 | 225 | 97 | 266 |
| 74 W | 388 ±17[e] | 23, 59, 84 | 312 ±3 | 96, 97 | 291 |
| 75 Re | 429 ±22 | 23, 85 | 275 | 99 | 287 |
| 76 Os | 500 | 23 | 400 | 105 | 283 |
| 77 Ir | 425 ±5 | 23, 61 | 228 | — | 255 |
| 78 Pt | 234 ±1 | 62, 86 | 225 ±5 | 96, 97 | 215 |
| 79 Au | 165 ±1 | 39, 43, 48, 62 | 178 ±8 | 96, 97 | 166 |
| 80 Hg | ~75 | 76 | 92 ±8 | 96, 97 | 62.0 |
| 81 Tl | 88 ±1 | 87, 88 | 96 | 97 | 90.1 |
| 82 Pb | 102 ±5 | 89, 90 | 87 ±1 | 96, 97 | 89.5 |
| 83 Bi | 119 ±2 | 91–93 | 116 ±5 | 96, 97 | 80.6 |
| 84 Po | (81)[f] | — | — | — | 77.1 |
| 87 Fr | (39)[f] | — | — | — | (37.5)[f] |
| 88 Ra | (89)[f] | — | — | — | (84.9)[f] |
| 89 Ac | (124)[f] | — | — | — | 118 |
| 90 Th | 170 | 94 | 100 | 97 | 151 |
| 91 Pa | (159)[f] | — | (262)[f] | — | (152)[f] |
| 92 U | 200 | 94 | 300 | — | 143 |
| 93 Np | (121)[f] | — | (163)[f] | — | 115 |
| 94 Pu | 171 | 95 | 176 | 95 | 118 |