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# The Crystal Structure of *tris*(thiourea)cadmium Sulphate

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*The crystal structure of* tris(*thiourea*)*cadmium sulphate has been determined by an X ray three-dimensional analysis. The crystals are triclinic P$\bar{1}$ with the following crystal data: Cd[SC(NH$_2$)$_2$]$_3$SO$_4$; M = 436.8; a = 8.77(2), b = 9.05(2), c = 9.83(1) Å. α = 91.3(2)°, β = 111.9(1)°, γ = 95.5(2)°, V = 718.9 Å$^3$, Z = 2, D$_o$ = 2.02, D$_c$ = 2.06 g cm$^{-3}$, F(000) = 432, μ = 179.5 cm$^{-1}$ (CuKα). The structure was solved by standard Patterson and Fourier three-dimensional methods and refined by differential synthesis down to R = 8.3%. Coordination around cadmium involves three sulphur atoms from three thiourea molecules (Cd–S = 2.52(1), 2.60(1), 2.63(2) Å) and one oxygen atom (Cd–O(2) = 2.29(2) Å) of a sulphate group, at the corners of a severely distorted tetrahedron. Two long contacts Cd–S = 2.85(2) Å and Cd–O = 2.88(2) Å complete the coordination around the metal atom to a distorted octahedron. The SO$_4^{2-}$ group behaves as a bidentate ligand but the bonds it makes with the metal atom have quite different lengths. The coordination octahedra are joined in dimers sharing an S–S edge. Packing is mainly due to NH ... O hydrogen bonds.*

## Introduction

The crystal structure of *tris*(thiourea)cadmium sulphate, Cd[SC(NH$_2$)$_2$]$_3$SO$_4$, has been determined to study the coordination around the metal atom, particularly in connection with the behaviour of the SO$_4^{2-}$ group which could play the role of an uncoordinated ion, or a monodentate ligand or a chelating agent or could be in a bridging situation.

## Experimental Section

Crystals of *tris*(thiourea)cadmium sulphate were obtained as thick triclinic prisms by slow concentration of an aqueous solution of the components.[1] Crystal data, determined by rotation and Weissenberg methods (CuKα, λ = 1.5418 Å), are as follows:

Cd[SC(NH$_2$)$_2$]$_3$SO$_4$, $M$ = 436.8

$a$ = 8.77(2), $b$ = 9.05(2), $c$ = 9.83(1) Å

α = 91.3(2)°, β = 111.9(1)°, γ = 95.5(2)°

$V$ = 718.9Å$^3$, $Z$ = 2, $D_o$ = 2.02, $D_c$ = 2.06 g cm$^{-3}$

$F$(000) = 432, μ = 179.5 cm$^{-1}$ (CuKα)

(1) M. Nardelli and I. Chierici, *Ric. Sci.*, *5*, 1017 (1958).

Space group: P$\bar{1}$ (from the structure analysis, in agreement with the lack of piezoelectricity).

Three-dimensional intensity data was collected at room temperature from integrated Weissenberg photographs (multiple film technique) around [100] and [010]. The total number of observed independent reflections was 2919 from 3226 possible ones.

Absorption effects were corrected as continuous, considering the crystal as a cylinder for the reflections taken around [100] ($r$ = 0.08 mm, μ$r$ = 1.5) and as a sphere for the reflections taken around [010] ($r$ = 0.15 mm, μ$r$ = 2.7). Correction for the shape of the spots in non-equatorial layers was applied using the formula $I_{corr} = I(1 \pm K \cos \vartheta)$ where $K$ is a constant determined empirically from the upper and lower parts of the photograph. After correction for Lorentz and polarization factors the structure amplitudes were put first in the same scale following Rollett and Sparks,[2] then in absolute scale by Wilson's[3] method, the mean isotropic temperature factor being $B$ = 2.13 Å$^2$.

*Structure analysis and refinement.* The structure was solved using the heavy atom technique starting from a three-dimensional Patterson map. The value of the conventional reliability index, when all the atoms from the Fourier synthesis were considered, was 17.7%. Refinement was carried out by Booth's differential synthesis with isotropic thermal parameters down to $R$ = 14.8%, then anisotropically down to the final $R$ = 8.3% value. At this point an $F_o$–$F_c$ synthesis was calculated to look for the hydrogen atoms, but their direct location was impossible. The calculated positions for the hydrogen atoms correspond to high positive electron density regions, which nevertheless were too smeared to be used for a direct location of the peaks. Introduction of hydrogen atoms contributions did not improve the $R$ value, so they were not taken into further consideration.

In Table I the final positional and thermal parameters, with their standard deviations and ratios e.s.d./coordinate shift, are quoted. A comparison of observed and calculated values for electron density and its second derivatives on the atomic peaks (Table II) gives an idea of the reliability of the analysis. No reliable discussion on the anisotropic parameters can be made, as the absorption effects were corrected only isotropically. In Table III observed and calculated structure factors are compared. The « less than »

(2) J. S. Rollett and R. A. Sparks, *Acta Cryst.*, *13*, 273 (1960).
(3) A. J. C. Wilson, *Nature, Lond.*, *150*, 151 (1942).

**Table I.** Final atomic fractional coordinates ($\times 10^4$), thermal parameters[a] ($\times 10$ Å$^2$) with e.s.d.'s and ratios (e.s.d.)/(coordinate shift)

| | $x/a(\sigma)$ | $y/b(\sigma)$ | $z/c(\sigma)$ | $B_{11}(\sigma)$ | $B_{22}(\sigma)$ | $B_{33}(\sigma)$ | $B_{12}(\sigma)$ | $B_{13}(\sigma)$ | $B_{23}(\sigma)$ | $\lvert r(x)\rvert$ | $\lvert r(z)\rvert$ | $\lvert r(y)\rvert$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cd | 2210(1) | 1122(1) | 1334(1) | 16(0) | 24(0) | 13(0) | 2(0) | 0(1) | 0(0) | 2 | 2 | 2 |
| S(1) | 1054(4) | 2733(3) | 3645(3) | 15(1) | 19(1) | 9(1) | −1(1) | 1(2) | −1(1) | 41 | 3 | 8 |
| S2) | 4229(5) | −794(4) | 2007(5) | 16(1) | 26(1) | 30(2) | 1(2) | 1(2) | 4(2) | 24 | 3 | 48 |
| S(3) | 368(4) | 980(3) | −1449(3) | 17(1) | 18(1) | 11(1) | 1(1) | 1(2) | 0(1) | 5 | 7 | 15 |
| S(4) | 3543(4) | 3735(4) | 963(4) | 18(1) | 30(1) | 16(1) | −4(2) | −1(2) | 2(1) | 7 | 35 | 18 |
| O(1) | −39(20) | 2755(10) | 2109(17) | 25(4) | 46(5) | 15(4) | 5(6) | −3(6) | 6(6) | 5 | 3 | 5 |
| O(2) | 2469(17) | 1903(15) | 3653(23) | 19(4) | 31(3) | 20(5) | 3(5) | 5(6) | 3(5) | 4 | 2 | 1 |
| O(3) | 161(18) | 1933(15) | 4475(12) | 38(4) | 45(4) | 25(5) | −3(5) | 13(6) | 4(5) | 5 | 37 | 41 |
| O(4) | 1692(22) | 4232(12) | 4347(14) | 29(4) | 18(2) | 29(4) | 1(5) | −6(6) | −5(4) | 17 | 6 | 14 |
| N(1) | 7195(17) | 10(22) | 3898(20) | 23(4) | 55(8) | 24(6) | 4(9) | −8(8) | 13(9) | 5 | 27 | 5 |
| N(2) | 6527(12) | 1225(10) | 1768(13) | 16(3) | 31(4) | 34(8) | −2(6) | 2(8) | 13(7) | 17 | 17 | 5 |
| N(3) | −470(22) | 3192(14) | −3135(17) | 34(6) | 30(4) | 14(5) | 5(7) | 1(8) | 6(6) | 10 | 14 | 16 |
| N(4) | −837(16) | 3436(9) | −933(13) | 25(5) | 28(4) | 15(5) | 9(7) | 2(7) | 5(6) | 6 | 3 | 44 |
| N(5) | 6348(18) | 5321(18) | 2407(17) | 44(6) | 68(5) | 29(8) | −21(8) | 7(10) | 1(8) | 6 | 13 | 15 |
| N(6) | 5366(17) | 3839(13) | 3842(12) | 32(4) | 41(3) | 17(5) | −18(5) | −4(7) | 2(5) | 10 | 12 | 6 |
| C(1) | 6130(19) | 277(13) | 2607(15) | 15(4) | 33(4) | 14(5) | −3(6) | 3(7) | 3(6) | 2 | 2 | 2 |
| C(2) | −386(13) | 2723(10) | −1841(11) | 13(4) | 22(3) | 12(5) | −2(5) | −2(6) | 1(5) | 7 | 2 | 4 |
| C(3) | 5195(15) | 4351(13) | 2545(13) | 22(5) | 23(2) | 20(6) | −7(5) | 6(8) | −5(5) | 6 | 133 | 3 |

[a] The anisotropic temperature factor is: $\exp -1/4(B_{11}h^2a^{*2}+B_{22}k^2b^{*2}+B_{33}l^2c^{*2}+2B_{12}hka^*b^*+2B_{13}hla^*c^*+2B_{23}klb^*c^*)$.

**Table II.** Atomic peak heights (e . Å$^{-3}$), curvatures (e . Å$^{-5}$) and e.s.d.'s

| | | ρ | $-A_{hh}$ | $-A_{kk}$ | $-A_{ll}$ | $A_{kl}$ | $A_{hl}$ | $A_{hk}$ |
|---|---|---|---|---|---|---|---|---|
| Cd | obs. | 142.4 | 1263 | 1309 | 1577 | 46 | 390 | 77 |
| | calc. | 141.5 | 1265 | 1324 | 1566 | 50 | 398 | 76 |
| S(1) | obs. | 42.3 | 379 | 403 | 486 | 27 | 130 | 8 |
| | calc. | 42.5 | 381 | 404 | 486 | 26 | 133 | 12 |
| S(2) | obs. | 35.6 | 329 | 351 | 327 | 31 | 93 | 14 |
| | calc. | 35.7 | 329 | 350 | 334 | 28 | 98 | 17 |
| S(3) | obs. | 43.9 | 390 | 449 | 518 | 22 | 121 | 14 |
| | calc. | 43.8 | 391 | 449 | 519 | 20 | 122 | 16 |
| S(4) | obs. | 37.2 | 322 | 331 | 405 | 22 | 84 | −10 |
| | calc. | 37.3 | 324 | 333 | 405 | 17 | 87 | −5 |
| O(1) | obs. | 12.8 | 98 | 118 | 102 | −3 | 40 | 10 |
| | calc. | 12.8 | 96 | 120 | 101 | −4 | 40 | 11 |
| O(2) | obs. | 13.8 | 122 | 114 | 85 | 26 | 37 | −6 |
| | calc. | 13.7 | 119 | 114 | 83 | 24 | 35 | −7 |
| O(3) | obs. | 11.8 | 88 | 84 | 114 | −3 | 25 | 12 |
| | calc. | 12.0 | 88 | 87 | 110 | −4 | 24 | 12 |
| O(4) | obs | 11.8 | 68 | 97 | 106 | 0 | 24 | 7 |
| | calc. | 12.1 | 71 | 96 | 106 | 0 | 24 | 8 |
| N(1) | obs. | 9.7 | 80 | 52 | 68 | 7 | 9 | 6 |
| | calc. | 10.1 | 85 | 69 | 79 | 8 | 13 | 5 |
| N(2) | obs. | 14.0 | 154 | 135 | 127 | 12 | 41 | 16 |
| | calc. | 13.8 | 153 | 134 | 129 | 9 | 44 | 18 |
| N(3) | obs. | 10.7 | 74 | 104 | 99 | 12 | 25 | 8 |
| | calc. | 11.0 | 75 | 104 | 99 | 10 | 26 | 8 |
| N(4) | obs. | 12.5 | 104 | 122 | 124 | −7 | 42 | 7 |
| | calc. | 12.5 | 103 | 119 | 125 | −5 | 41 | 4 |
| N(5) | obs. | 9.3 | 81 | 56 | 76 | −1 | 16 | −6 |
| | calc. | 9.2 | 84 | 57 | 77 | 0 | 19 | −5 |
| N(6) | obs. | 10.4 | 79 | 75 | 99 | −1 | 12 | −10 |
| | calc. | 10.6 | 79 | 77 | 97 | 1 | 12 | −10 |
| C(1) | obs. | 10.3 | 87 | 78 | 94 | −1 | 28 | −12 |
| | calc. | 10.2 | 87 | 80 | 93 | −2 | 30 | −13 |
| C(2) | obs. | 12.3 | 109 | 140 | 134 | 12 | 25 | 9 |
| | calc. | 12.3 | 110 | 141 | 133 | 10 | 25 | 11 |
| C(3) | obs. | 10.9 | 104 | 89 | 117 | 9 | 30 | −7 |
| | calc. | 10.9 | 105 | 86 | 118 | 9 | 29 | −6 |
| e.s.d.'s | e.s.d.'s | 0.3 | 4 | 5 | 5 | 3 | 3 | 3 |

values are referred to the reflections which are too weak to be observed, taken as equal to $I_{min}-1$.

Standard deviations have been calculated following Cruickshank[4] for the electron density and its derivatives, Ahmed and Cruickshank[5] for bond lengths, Darlow[6] for angles; the effects of the errors in the cell parameters were considered following Darlow and Cochran.[7]

The atomic factors used throughout the calculations were those of Cromer and Mann.[8]

Table IV gives the more interesting distances and angles.

Calculations were performed on the Olivetti Elea 6001/*S* computer of the *Centro di Calcolo Elettronico dell'Università di Parma.*

## Discussion

Coordination around the metal atom involves three sulphur atoms from three thiourea molecules and one oxygen atom from a $SO_4^{2-}$ group in a severely distorted tetrahedral arrangement (Figure 1). The Cd–O(2) distance is a little longer than the sum of the Pauling covalent radii (2.22 Å) and is in agreement with those found in *bis*(acetamide)cadmium chloride[9] (2.23 Å) and in bis(thiourea)cadmium formate[10] (2.28 Å). The Cd–S distances are of two kinds: one shorter (Cd–S(2) = 2.52 Å) and two longer (Cd–S(3) = 2.60, Cd–S(4) = 2.63 Å). The first one is equal to the sum of Pauling covalent radii (2.52 Å) and is in agreement with those found in other cadmium tetrahedral complexes: 2.45 Å in *bis*-(thiourea)cadmium chloride;[11] 2.52 Å in *bis*(ethylenthiourea)cadmium chloride.[12] The other two distances are not significantly different and their values are intermediate between the sum of the covalent and the sum of the ionic radii (2.87 Å). They are in agree-

(4) D. W. J. Cruickshank, *Acta Cryst.*, 2, 65 (1949).
(5) F. R. Ahmed and D. W. J. Cruickshank, *Acta Cryst.*, 6, 385 (1953).
(6) S. F. Darlow, *Acta Cryst.*, *13*, 683 (1960).
(7) S. F. Darlow and W. Cochran, *Acta Cryst.*, *14*, 1250 (1961).
(8) D. T. Cromer and J. B. Mann, *Acta Cryst.*, *A24*, 321 (1968).
(9) L. Cavalca, M. Nardelli, and L. Coghi, *Nuovo Cimento*, *10*, 278 (1957).
(10) M. Nardelli, G. Fava Gasparri, and P. Boldrini, *Acta Cryst.*, *18*, 618 (1965).
(11) M. Nardelli, L. Cavalca, and A. Braibanti, *Gazz. Chim.*, *87*, 137 (1957).
(12) L. Cavalca, P. Domiano, A. Musatti, and P. Sgarabotto, *Chem. Comm.*, *p.* 1136 (1968).

**Table III.** Observed and calculated structure factors. A minus sign for $F_o$ means « less than »

| h | k | l | $10F_o$ | $10F_c$ | h | k | l | $10F_o$ | $10F_c$ | h | k | l | $10F_o$ | $10F_c$ | h | k | l | $10F_o$ | $10F_c$ | h | k | l | $10F_o$ | $10F_c$ | h | k | l | $10F_o$ | $10F_c$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | 0 | 0 | 100 | -62 | 2 | 6 | 0 | 365 | -377 | 4 | 1 | 1 | 851 | 851 | 3 | 4 | 1 | 265 | 240 | 4 | 7 | 1 | 134 | 59 | 5 | 0 | 2 | 45- | 53 | 6 | 3 | 2 | 348 | 343 |
| 3 | 0 | 0 | 268 | 180 | 3 | 6 | 0 | 82- | -3 | 4 | 1 | 1 | 791 | 816 | 4 | 4 | 1 | 319 | -273 | 4 | 7 | 1 | 148 | 124 | 6 | 0 | 2 | 248 | -218 | 6 | 3 | 2 | 177 | -165 |
| 4 | 0 | 0 | 468 | 410 | 3 | 6 | 0 | 334 | 367 | 4 | 1 | 1 | 23- | 2 | 4 | 4 | 1 | 668 | -590 | 4 | 7 | 1 | 154 | 93 | 6 | 0 | 2 | 448 | 490 | 6 | 3 | 2 | 151 | -127 |
| 5 | 0 | 0 | 574 | 572 | 4 | 6 | 0 | 274 | -362 | 4 | 1 | 1 | 711 | -711 | 4 | 4 | 1 | 257 | 232 | 4 | 7 | 1 | 434 | 405 | 7 | 0 | 2 | 94 | 78 | 6 | 3 | 2 | 45 | -36 |
| 6 | 0 | 0 | 254 | -244 | 4 | 6 | 0 | 199 | 182 | 5 | 1 | 1 | 165 | -166 | 4 | 4 | 1 | 391 | 296 | 5 | 7 | 1 | 231 | 248 | 7 | 0 | 2 | 139 | -129 | 7 | 3 | 2 | 225 | 245 |
| 7 | 0 | 0 | 414 | -419 | 5 | 6 | 0 | 111 | 95 | 5 | 1 | 1 | 177 | 191 | 5 | 4 | 1 | 177 | -154 | 5 | 7 | 1 | 199 | -200 | 8 | 0 | 2 | 302 | 358 | 7 | 3 | 2 | 688 | -649 |
| 8 | 0 | 0 | 111 | 106 | 5 | 6 | 0 | 525 | -508 | 5 | 1 | 1 | 674 | 598 | 5 | 4 | 1 | 62- | 22 | 5 | 7 | 1 | 168 | 178 | 8 | 0 | 2 | 362 | -384 | 7 | 3 | 2 | 382 | -377 |
| 9 | 0 | 0 | 297 | 343 | 6 | 6 | 0 | 202 | 207 | 5 | 1 | 1 | 585 | 602 | 5 | 4 | 1 | 354 | -330 | 5 | 7 | 1 | 91- | 10 | 9 | 0 | 2 | 39- | 31 | 7 | 3 | 2 | 442 | 425 |
| 10 | 0 | 0 | 37- | 2 | 6 | 6 | 0 | 99 | -91 | 6 | 1 | 1 | 454 | -436 | 5 | 4 | 1 | 168 | -165 | 6 | 7 | 1 | 102 | 131 | 9 | 0 | 2 | 99 | -111 | 8 | 3 | 2 | 291 | -279 |
| 0 | 1 | 0 | 848 | 754 | 7 | 6 | 0 | 91 | -91 | 6 | 1 | 1 | 99 | 97 | 6 | 4 | 1 | 188 | 187 | 6 | 7 | 1 | 197 | -212 | 10 | 0 | 2 | 122 | 131 | 8 | 3 | 2 | 51- | 20 |
| 1 | 1 | 0 | 784 | -704 | 7 | 6 | 0 | 197 | 178 | 6 | 1 | 1 | 405 | -361 | 6 | 4 | 1 | 619 | 617 | 6 | 7 | 1 | 268 | 288 | 0 | 1 | 2 | 328 | -263 | 8 | 3 | 2 | 251 | 324 |
| 1 | 1 | 0 | 1062 | 1052 | 8 | 6 | 0 | 111 | -104 | 7 | 1 | 1 | 191 | 163 | 6 | 4 | 1 | 319 | -302 | 6 | 7 | 1 | 265 | -264 | 0 | 1 | 2 | 302 | -377 | 8 | 3 | 2 | 74- | -8 |
| 2 | 1 | 0 | 960 | -946 | 0 | 7 | 0 | 68- | 66 | 7 | 1 | 1 | 214 | -153 | 6 | 4 | 1 | 77 | 36 | 7 | 7 | 1 | 162 | -171 | 1 | 1 | 2 | 257 | -202 | 9 | 3 | 2 | 485 | 508 |
| 2 | 1 | 0 | 102 | -92 | 1 | 7 | 0 | 575 | 619 | 7 | 1 | 1 | 582 | -583 | 7 | 4 | 1 | 197 | 199 | 7 | 7 | 1 | 197 | 203 | 1 | 1 | 2 | 620 | -680 | 10 | 3 | 2 | 57 | -70 |
| 3 | 1 | 0 | 499 | 444 | 1 | 7 | 0 | 239 | -275 | 8 | 1 | 1 | 99 | 77 | 7 | 4 | 1 | 102 | 101 | 7 | 7 | 1 | 239 | 215 | 1 | 1 | 2 | 311 | 231 | 0 | 4 | 2 | 214 | -171 |
| 3 | 1 | 0 | 577 | -542 | 2 | 7 | 0 | 148 | 126 | 8 | 1 | 1 | 65- | 63 | 7 | 4 | 1 | 182 | 201 | 7 | 7 | 1 | 265 | -257 | 1 | 1 | 2 | 1109 | 1172 | 0 | 4 | 2 | 108 | 53 |
| 4 | 1 | 0 | 685 | 643 | 2 | 7 | 0 | 382 | -394 | 9 | 1 | 1 | 91 | -82 | 7 | 4 | 1 | 645 | 641 | 0 | 8 | 1 | 145 | 157 | 2 | 1 | 2 | 634 | 611 | 1 | 4 | 2 | 629 | 617 |
| 4 | 1 | 0 | 468 | 427 | 3 | 7 | 0 | 285 | -316 | 9 | 1 | 1 | 188 | 199 | 8 | 4 | 1 | 337 | -347 | 0 | 8 | 1 | 402 | 403 | 2 | 1 | 2 | 901 | -984 | 1 | 4 | 2 | 705 | 671 |
| 5 | 1 | 0 | 465 | 428 | 3 | 7 | 0 | 25- | 4 | 10 | 1 | 1 | 197 | 193 | 8 | 4 | 1 | 188 | 202 | 1 | 8 | 1 | 85- | 32 | 2 | 1 | 2 | 262 | -220 | 1 | 4 | 2 | 734 | -790 |
| 5 | 1 | 0 | 588 | 590 | 4 | 7 | 0 | 25- | -5 | 0 | 2 | 1 | 54- | 71 | 8 | 4 | 1 | 62- | 47 | 1 | 8 | 1 | 222 | -236 | 2 | 1 | 2 | 879 | 940 | 1 | 4 | 2 | 740 | -710 |
| 6 | 1 | 0 | 674 | -668 | 4 | 7 | 0 | 119 | 129 | 0 | 2 | 1 | 477 | 468 | 9 | 4 | 1 | 108 | -110 | 1 | 8 | 1 | 342 | 426 | 3 | 1 | 2 | 457 | 409 | 2 | 4 | 2 | 632 | 598 |
| 6 | 1 | 0 | 57 | -73 | 5 | 7 | 0 | 99 | 54 | 1 | 2 | 1 | 314 | -238 | 0 | 5 | 1 | 462 | -415 | 1 | 8 | 1 | 74- | -19 | 3 | 1 | 2 | 697 | 731 | 2 | 4 | 2 | 531 | -491 |
| 7 | 1 | 0 | 114 | 93 | 5 | 7 | 0 | 268 | -267 | 1 | 2 | 1 | 1100 | 1109 | 0 | 5 | 1 | 751 | -758 | 2 | 8 | 1 | 334 | -378 | 3 | 1 | 2 | 679 | -768 | 2 | 4 | 2 | 357 | -351 |
| 7 | 1 | 0 | 288 | -275 | 6 | 7 | 0 | 277 | 292 | 1 | 2 | 1 | 277 | -199 | 1 | 5 | 1 | 274 | 264 | 2 | 8 | 1 | 148 | -158 | 3 | 1 | 2 | 454 | -376 | 2 | 4 | 2 | 139 | -64 |
| 8 | 1 | 0 | 205 | 246 | 6 | 7 | 0 | 322 | -308 | 1 | 2 | 1 | 91 | 18 | 1 | 5 | 1 | 165 | 158 | 2 | 8 | 1 | 294 | 327 | 4 | 1 | 2 | 431 | 398 | 3 | 4 | 2 | 382 | -320 |
| 9 | 1 | 0 | 97 | 94 | 7 | 7 | 0 | 94 | -99 | 2 | 2 | 1 | 414 | 345 | 1 | 5 | 1 | 117 | -52 | 2 | 8 | 1 | 474 | -528 | 4 | 1 | 2 | 837 | 854 | 3 | 4 | 2 | 348 | -318 |
| 10 | 1 | 0 | 99 | -97 | 7 | 7 | 0 | 25- | -23 | 2 | 2 | 1 | 54- | 43 | 1 | 5 | 1 | 951 | -1004 | 3 | 8 | 1 | 70- | 39 | 4 | 1 | 2 | 245 | -233 | 3 | 4 | 2 | 111 | -91 |
| 0 | 2 | 0 | 34- | 32 | 0 | 8 | 0 | 309- | 304 | 2 | 2 | 1 | 1519 | -1579 | 2 | 5 | 1 | 182 | 162 | 3 | 8 | 1 | 337 | 328 | 4 | 1 | 2 | 602 | -635 | 3 | 4 | 2 | 508 | 432 |
| 1 | 2 | 0 | 1031 | -1266 | 1 | 8 | 0 | 161 | 179 | 2 | 2 | 1 | 1508 | 1547 | 2 | 5 | 1 | 499 | 529 | 3 | 8 | 1 | 85- | -86 | 5 | 1 | 2 | 754 | -724 | 4 | 4 | 2 | 434 | -417 |
| 1 | 2 | 0 | 466 | -337 | 1 | 8 | 0 | 114 | -80 | 3 | 2 | 1 | 771 | 754 | 2 | 5 | 1 | 317 | 304 | 3 | 8 | 1 | 254 | -230 | 5 | 1 | 2 | 68- | -30 | 4 | 4 | 2 | 100 | -85 |
| 2 | 2 | 0 | 1108 | -1144 | 2 | 8 | 0 | 245 | -254 | 3 | 2 | 1 | 405 | -358 | 2 | 5 | 1 | 174 | -149 | 4 | 8 | 1 | 211 | 272 | 5 | 1 | 2 | 494 | 460 | 4 | 4 | 2 | 748 | 765 |
| 2 | 2 | 0 | 568 | 529 | 2 | 8 | 0 | 259 | -297 | 3 | 2 | 1 | 57- | -68 | 3 | 5 | 1 | 85- | 48 | 4 | 8 | 1 | 82 | 59 | 5 | 1 | 2 | 339 | -333 | 4 | 4 | 2 | 222 | 167 |
| 3 | 2 | 0 | 585 | 516 | 3 | 8 | 0 | 148 | -206 | 3 | 2 | 1 | 511 | -421 | 3 | 5 | 1 | 74 | -50 | 4 | 8 | 1 | 62- | -109 | 6 | 1 | 2 | 142 | -141 | 5 | 4 | 2 | 85 | -61 |
| 3 | 2 | 0 | 814 | -831 | 3 | 8 | 0 | 234 | 227 | 4 | 2 | 1 | 254 | 191 | 3 | 5 | 1 | 182 | 198 | 4 | 8 | 1 | 211 | 206 | 6 | 1 | 2 | 122 | 99 | 5 | 4 | 2 | 348 | 335 |
| 4 | 2 | 0 | 185 | 173 | 4 | 8 | 0 | 77- | 33 | 4 | 2 | 1 | 482 | 441 | 3 | 5 | 1 | 382 | 320 | 5 | 8 | 1 | 242 | 260 | 6 | 1 | 2 | 301 | 281 | 5 | 4 | 2 | 79 | 50 |
| 4 | 2 | 0 | 242 | -191 | 4 | 8 | 0 | 119 | 114 | 4 | 2 | 1 | 297 | 249 | 4 | 5 | 1 | 717 | -729 | 5 | 8 | 1 | 77- | 7 | 7 | 1 | 2 | 428 | 413 | 5 | 4 | 2 | 319 | -244 |
| 5 | 2 | 0 | 617 | -572 | 5 | 8 | 0 | 191 | 231 | 4 | 2 | 1 | 948 | -898 | 4 | 5 | 1 | 771 | -746 | 5 | 8 | 1 | 139 | 155 | 7 | 1 | 2 | 82 | -62 | 6 | 4 | 2 | 77 | 37 |
| 5 | 2 | 0 | 954 | 1000 | 5 | 8 | 0 | 77- | -61 | 5 | 2 | 1 | 479 | -463 | 4 | 5 | 1 | 202 | -206 | 5 | 8 | 1 | 174 | 187 | 7 | 1 | 2 | 648 | -655 | 6 | 4 | 2 | 214 | 213 |
| 6 | 2 | 0 | 422 | -419 | 6 | 8 | 0 | 245 | 245 | 5 | 2 | 1 | 574 | 559 | 4 | 5 | 1 | 154 | 103 | 6 | 8 | 1 | 119 | 35 | 8 | 1 | 2 | 134 | 125 | 6 | 4 | 2 | 209 | -225 |
| 6 | 2 | 0 | 451 | 463 | 6 | 8 | 0 | 282 | -320 | 5 | 2 | 1 | 114 | -71 | 5 | 5 | 1 | 122 | 129 | 6 | 8 | 1 | 211 | -237 | 8 | 1 | 2 | 162 | -164 | 6 | 4 | 2 | 351 | -335 |
| 7 | 2 | 0 | 111 | -68 | 7 | 8 | 0 | 362 | -351 | 5 | 2 | 1 | 125 | 86 | 5 | 5 | 1 | 319 | -277 | 6 | 8 | 1 | 185 | 208 | 9 | 1 | 2 | 45- | -18 | 7 | 4 | 2 | 62- | -37 |
| 7 | 2 | 0 | 74- | 18 | 0 | 9 | 0 | 219 | 227 | 6 | 2 | 1 | 228 | -197 | 5 | 5 | 1 | 719 | -743 | 6 | 8 | 1 | 68- | 26 | 9 | 1 | 2 | 117 | -88 | 7 | 4 | 2 | 437 | -406 |
| 8 | 2 | 0 | 97- | 105 | 1 | 9 | 0 | 74- | 40 | 6 | 2 | 1 | 54 | -21 | 5 | 5 | 1 | 391 | -350 | 7 | 8 | 1 | 59- | 16 | 10 | 1 | 2 | 139 | 140 | 7 | 4 | 2 | 234 | 210 |
| 9 | 2 | 0 | 134 | -146 | 1 | 9 | 0 | 105 | 96 | 6 | 2 | 1 | 519 | -510 | 6 | 5 | 1 | 139 | 149 | 7 | 8 | 1 | 51 | -98 | 0 | 2 | 2 | 659 | -573 | 7 | 4 | 2 | 368 | 360 |
| 10 | 2 | 0 | 205 | -239 | 2 | 9 | 0 | 88- | -106 | 7 | 2 | 1 | 294 | 286 | 6 | 5 | 1 | 119 | 125 | 7 | 8 | 1 | 348 | -352 | 0 | 2 | 2 | 317 | 298 | 8 | 4 | 2 | 542 | -567 |
| 0 | 3 | 0 | 80 | -78 | 2 | 9 | 0 | 314 | -357 | 7 | 2 | 1 | 514 | -472 | 6 | 5 | 1 | 191 | 151 | 8 | 8 | 1 | 68- | -75 | 1 | 2 | 2 | 68- | -35 | 8 | 4 | 2 | 371 | 397 |
| 1 | 3 | 0 | 634 | -591 | 3 | 9 | 0 | 91- | -50 | 7 | 2 | 1 | 305 | -289 | 6 | 5 | 1 | 105 | -86 | 0 | 9 | 1 | 94- | 87 | 1 | 2 | 2 | 51- | 12 | 9 | 4 | 2 | 154 | 165 |
| 1 | 3 | 0 | 631 | 533 | 4 | 9 | 0 | 197 | 216 | 8 | 2 | 1 | 88- | 68 | 7 | 5 | 1 | 179 | -171 | 0 | 9 | 1 | 397 | 399 | 1 | 2 | 2 | 868 | 930 | 0 | 5 | 2 | 839 | 843 |
| 2 | 3 | 0 | 180 | 100 | 5 | 9 | 0 | 151 | 194 | 8 | 2 | 1 | 71- | -10 | 7 | 5 | 1 | 74- | 30 | 1 | 9 | 1 | 71- | -24 | 1 | 2 | 2 | 734 | 655 | 0 | 5 | 2 | 151 | -71 |
| 2 | 3 | 0 | 970 | 829 | 6 | 9 | 0 | 94 | -110 | 8 | 2 | 1 | 239 | 235 | 7 | 5 | 1 | 268 | 285 | 1 | 9 | 1 | 74- | 46 | 2 | 2 | 2 | 839 | 817 | 1 | 5 | 2 | 419 | 439 |
| 3 | 3 | 0 | 851 | 826 | 7 | 9 | 0 | 279 | -248 | 9 | 2 | 1 | 71 | 74 | 7 | 5 | 1 | 285 | 255 | 1 | 9 | 1 | 74- | 128 | 2 | 2 | 2 | 1042 | -1097 | 1 | 5 | 2 | 485 | 490 |
| 3 | 3 | 0 | 491 | -418 | 0 | 10 | 0 | 234 | 253 | 9 | 2 | 1 | 208 | 243 | 8 | 5 | 1 | 262 | -264 | 1 | 9 | 1 | 308 | 329 | 2 | 2 | 2 | 565 | -535 | 1 | 5 | 2 | 302 | -323 |
| 4 | 3 | 0 | 360 | -333 | 1 | 10 | 0 | 59- | 14 | 10 | 2 | 1 | 39- | -13 | 8 | 5 | 1 | 137 | 140 | 2 | 9 | 1 | 88- | -139 | 2 | 2 | 2 | 697 | 616 | 1 | 5 | 2 | 239 | -218 |
| 4 | 3 | 0 | 526 | -502 | 1 | 10 | 0 | 151 | 172 | 0 | 3 | 1 | 365 | -303 | 9 | 5 | 1 | 37- | 12 | 2 | 9 | 1 | 139 | -149 | 3 | 2 | 2 | 599 | 537 | 2 | 5 | 2 | 85- | 24 |
| 5 | 3 | 0 | 486 | -446 | 2 | 10 | 0 | 74- | -110 | 0 | 3 | 1 | 45- | 39 | 0 | 6 | 1 | 74 | 37 | 2 | 9 | 1 | 88- | 94 | 3 | 2 | 2 | 537 | -491 | 2 | 5 | 2 | 425 | 428 |
| 5 | 3 | 0 | 171 | -134 | 2 | 10 | 0 | 79- | -80 | 1 | 3 | 1 | 191 | -131 | 0 | 6 | 1 | 414 | -440 | 2 | 9 | 1 | 197 | -204 | 3 | 2 | 2 | 937 | -1017 | 2 | 5 | 2 | 137 | 105 |
| 6 | 3 | 0 | 562 | -591 | 3 | 10 | 0 | 151 | -186 | 1 | 3 | 1 | 511 | 491 | 1 | 6 | 1 | 468 | 469 | 3 | 9 | 1 | 77- | 92 | 3 | 2 | 2 | 988 | 953 | 2 | 5 | 2 | 245 | -207 |
| 6 | 3 | 0 | 688 | 721 | 4 | 10 | 0 | 37- | -47 | 1 | 3 | 1 | 951 | -923 | 1 | 6 | 1 | 71 | -50 | 3 | 9 | 1 | 191 | 179 | 4 | 2 | 2 | 174 | -143 | 3 | 5 | 2 | 528 | -497 |
| 7 | 3 | 0 | 77- | -29 | 5 | 10 | 0 | 302 | 309 | 1 | 3 | 1 | 668 | 576 | 1 | 6 | 1 | 182 | -193 | 3 | 9 | 1 | 454 | -481 | 4 | 2 | 2 | 451 | 394 | 3 | 5 | 2 | 357 | -360 |
| 7 | 3 | 0 | 377 | 324 | 0 | 11 | 0 | 225 | 214 | 2 | 3 | 1 | 757 | 695 | 1 | 6 | 1 | 362 | -348 | 4 | 9 | 1 | 34- | 380 | 4 | 2 | 2 | 665 | 654 | 3 | 5 | 2 | 611 | 659 |
| 8 | 3 | 0 | 131 | 121 | 1 | 11 | 0 | 274 | 277 | 2 | 3 | 1 | 228 | -200 | 2 | 6 | 1 | 102 | -84 | 4 | 9 | 1 | 142 | 181 | 4 | 2 | 2 | 337 | -304 | 3 | 5 | 2 | 765 | 704 |
| 9 | 3 | 0 | 245 | -257 | 2 | 11 | 0 | 37- | 35 | 2 | 3 | 1 | 662 | -660 | 2 | 6 | 1 | 122 | 130 | 4 | 9 | 1 | 114 | -100 | 5 | 2 | 2 | 328 | -312 | 4 | 5 | 2 | 428 | -404 |
| 0 | 4 | 0 | 865 | -839 | 2 | 11 | 0 | 125- | 110 | 2 | 3 | 1 | 999 | 1052 | 2 | 6 | 1 | 442 | 542 | 5 | 9 | 1 | 37- | -37 | 5 | 2 | 2 | 74- | 34 | 4 | 5 | 2 | 571 | -557 |
| 1 | 4 | 0 | 240 | 184 | 3 | 11 | 0 | 51- | -42 | 3 | 3 | 1 | 202 | 176 | 2 | 6 | 1 | 379 | -357 | 5 | 9 | 1 | 62- | 12 | 5 | 2 | 2 | 259 | 220 | 4 | 5 | 2 | 619 | 743 |
| 1 | 4 | 0 | 70- | 76 | 4 | 11 | 0 | 48 | -88 | 3 | 3 | 1 | 717 | -715 | 3 | 6 | 1 | 700 | -667 | 5 | 9 | 1 | 68- | 49 | 5 | 2 | 2 | 159 | -137 | 4 | 5 | 2 | 491 | 405 |
| 2 | 4 | 0 | 271 | 233 | 0 | 0 | 1 | 575 | 541 | 3 | 3 | 1 | 557 | 562 | 3 | 6 | 1 | 448 | 448 | 6 | 9 | 1 | 239 | -273 | 6 | 2 | 2 | 448 | 444 | 5 | 5 | 2 | 325 | 319 |
| 2 | 4 | 0 | 760 | 696 | 1 | 0 | 1 | 858 | -956 | 3 | 3 | 1 | 1014 | 890 | 3 | 6 | 1 | 68- | -64 | 6 | 9 | 1 | 79 | 57 | 6 | 2 | 2 | 159 | -148 | 5 | 5 | 2 | 379 | 355 |
| 3 | 4 | 0 | 359 | 346 | 1 | 0 | 1 | 701 | 787 | 4 | 3 | 1 | 765 | -703 | 3 | 6 | 1 | 23- | -26 | 7 | 9 | 1 | 194 | -204 | 6 | 2 | 2 | 225 | -176 | 5 | 5 | 2 | 294 | 312 |
| 3 | 4 | 0 | 57- | -47 | 2 | 0 | 1 | 708 | -834 | 4 | 3 | 1 | 354 | -220 | 4 | 6 | 1 | 425 | -437 | 0 | 10 | 1 | 79- | 3 | 6 | 2 | 2 | 102 | 101 | 5 | 5 | 2 | 134 | 91 |
| 4 | 4 | 0 | 380 | -355 | 2 | 0 | 1 | 339 | 218 | 4 | 3 | 1 | 408 | 398 | 4 | 6 | 1 | 457 | -461 | 0 | 10 | 1 | 219 | 234 | 7 | 2 | 2 | 548 | 572 | 6 | 5 | 2 | 177 | 166 |
| 4 | 4 | 0 | 322 | -278 | 3 | 0 | 1 | 371 | 377 | 4 | 3 | 1 | 108 | -67 | 4 | 6 | 1 | 268 | -310 | 1 | 10 | 1 | 57- | -69 | 7 | 2 | 2 | 248 | -214 | 6 | 5 | 2 | 268 | 264 |
| 5 | 4 | 0 | 494 | -468 | 3 | 0 | 1 | 122 | -96 | 5 | 3 | 1 | 245 | -231 | 4 | 6 | 1 | 391 | 330 | 1 | 10 | 1 | 62- | -55 | 7 | 2 | 2 | 468 | -458 | 6 | 5 | 2 | 128 | -138 |
| 5 | 4 | 0 | 508 | -458 | 4 | 0 | 1 | 559 | 548 | 5 | 3 | 1 | 548 | 522 | 5 | 6 | 1 | 174 | 153 | 1 | 10 | 1 | 59- | -7 | 7 | 2 | 2 | 114 | 104 | 6 | 5 | 2 | 331 | -320 |
| 6 | 4 | 0 | 51- | 2 | 4 | 0 | 1 | 314 | -243 | 5 | 3 | 1 | 354 | -315 | 5 | 6 | 1 | 534 | -547 | 1 | 10 | 1 | 288 | 325 | 8 | 2 | 2 | 77- | 42 | 7 | 5 | 2 | 257 | -247 |
| 6 | 4 | 0 | 122 | 133 | 5 | 0 | 1 | 162 | 145 | 5 | 3 | 1 | 134 | -162 | 5 | 6 | 1 | 62- | 11 | 2 | 10 | 1 | 65- | -68 | 8 | 2 | 2 | 137 | -159 | 7 | 5 | 2 | 71- | 13 |
| 7 | 4 | 0 | 374 | 377 | 5 | 0 | 1 | 688 | 742 | 6 | 3 | 1 | 202 | -168 | 5 | 6 | 1 | 519 | -395 | 2 | 10 | 1 | 79- | -41 | 8 | 2 | 2 | 111- | -93 | 7 | 5 | 2 | 297 | 299 |
| 7 | 4 | 0 | 494 | 437 | 6 | 0 | 1 | 282 | -276 | 6 | 3 | 1 | 451 | 538 | 6 | 6 | 1 | 65 | 91 | 2 | 10 | 1 | 102 | 110 | 9 | 2 | 2 | 305 | 331 | 7 | 5 | 2 | 79- | 38 |
| 8 | 4 | 0 | 211 | 226 | 6 | 0 | 1 | 159 | 154 | 6 | 3 | 1 | 165 | -129 | 6 | 6 | 1 | 39- | -35 | 3 | 10 | 1 | 74- | -16 | 10 | 2 | 2 | 151 | 173 | 8 | 5 | 2 | 59- | 38 |
| 9 | 4 | 0 | 231 | -252 | 7 | 0 | 1 | 119 | -111 | 6 | 3 | 1 | 234 | 254 | 6 | 6 | 1 | 311 | 349 | 3 | 10 | 1 | 168 | -152 | 0 | 3 | 2 | 588 | -532 | 9 | 5 | 2 | 91 | 74 |
| 0 | 5 | 0 | 679 | -693 | 7 | 0 | 1 | 628 | -665 | 7 | 3 | 1 | 388 | 381 | 6 | 6 | 1 | 322 | -278 | 4 | 10 | 1 | 239 | 263 | 0 | 3 | 2 | 568 | 571 | 0 | 6 | 2 | 451 | 434 |
| 1 | 5 | 0 | 239 | -194 | 8 | 0 | 1 | 248 | 281 | 7 | 3 | 1 | 528 | -484 | 7 | 6 | 1 | 217 | -209 | 4 | 10 | 1 | 214 | -222 | 1 | 3 | 2 | 402 | -351 | 0 | 6 | 2 | 125 | -106 |
| 1 | 5 | 0 | 602 | -560 | 8 | 0 | 1 | 322 | -345 | 7 | 3 | 1 | 208 | -186 | 7 | 6 | 1 | 59- | 47 | 5 | 10 | 1 | 54- | 82 | 1 | 3 | 2 | 48- | 47 | 1 | 6 | 2 | 21- | -22 |
| 2 | 5 | 0 | 205 | -122 | 9 | 0 | 1 | 254 | 299 | 7 | 3 | 1 | 534 | 520 | 7 | 6 | 1 | 242 | 263 | 6 | 10 | 1 | 85 | 96 | 1 | 3 | 2 | 288 | -252 | 1 | 6 | 2 | 219 | 193 |
| 2 | 5 | 0 | 425 | 374 | 9 | 0 | 1 | 59- | 32 | 8 | 3 | 1 | 151 | 141 | 7 | 6 | 1 | 82 | 61 | 0 | 11 | 1 | 85 | -122 | 1 | 3 | 2 | 245 | -225 | 1 | 6 | 2 | 197 | -216 |
| 3 | 5 | 0 | 94 | -61 | 10 | 0 | 1 | 214 | -297 | 8 | 3 | 1 | 319 | 350 | 8 | 6 | 1 | 37- | -44 | 0 | 11 | 1 | 225 | 219 | 2 | 3 | 2 | 1022 | 1060 | 1 | 6 | 2 | 111 | -95 |
| 3 | 5 | 0 | 359 | 342 | 10 | 0 | 1 | 159 | 181 | 9 | 3 | 1 | 268 | -274 | 8 | 6 | 1 | 85 | 51 | 1 | 11 | 1 | 45- | 50 | 2 | 3 | 2 | 814 | -851 | 2 | 6 | 2 | 331 | -311 |
| 4 | 5 | 0 | 451 | -436 | 0 | 1 | 1 | 288 | -198 | 9 | 3 | 1 | 42- | -39 | 0 | 7 | 1 | 131 | 136 | 1 | 11 | 1 | 225 | 238 | 2 | 3 | 2 | 1045 | -1170 | 2 | 6 | 2 | 328 | 355 |
| 4 | 5 | 0 | 91 | -58 | 0 | 1 | 1 | 1058 | 1248 | 0 | 4 | 1 | 606 | -592 | 0 | 7 | 1 | 405 | -433 | 2 | 11 | 1 | 57- | -45 | 2 | 3 | 2 | 139 | 71 | 2 | 6 | 2 | 652 | 702 |
| 5 | 5 | 0 | 191 | -187 | 1 | 1 | 1 | 405 | -308 | 0 | 4 | 1 | 957 | -1015 | 1 | 7 | 1 | 299 | 276 | 2 | 11 | 1 | 168 | 175 | 3 | 3 | 2 | 194 | -204 | 2 | 6 | 2 | 217 | -202 |
| 5 | 5 | 0 | 528 | -485 | 1 | 1 | 1 | 37- | 38 | 1 | 4 | 1 | 128 | 117 | 1 | 7 | 1 | 311 | -356 | 3 | 11 | 1 | 51- | 72 | 3 | 3 | 2 | 359 | -350 | 3 | 6 | 2 | 465 | -465 |
| 6 | 5 | 0 | 408 | 459 | 1 | 1 | 1 | 354 | 290 | 1 | 4 | 1 | 625 | 608 | 1 | 7 | 1 | 237 | 258 | 0 | 0 | 2 | 645 | -705 | 3 | 3 | 2 | 177 | -163 | 3 | 6 | 2 | 42 | 56 |
| 6 | 5 | 0 | 74 | 65 | 1 | 1 | 1 | 805 | 690 | 1 | 4 | 1 | 857 | -822 | 1 | 7 | 1 | 297 | -275 | 1 | 0 | 2 | 525 | -534 | 3 | 3 | 2 | 671 | 606 | 3 | 6 | 2 | 385 | 487 |
| 7 | 5 | 0 | 188 | 195 | 2 | 1 | 1 | 688 | 651 | 1 | 4 | 1 | 559 | -494 | 2 | 7 | 1 | 579 | -569 | 1 | 0 | 2 | 1002 | 930 | 4 | 3 | 2 | 279 | -232 | 3 | 6 | 2 | 122 | 42 |
| 7 | 5 | 0 | 248 | 219 | 2 | 1 | 1 | 711 | -870 | 2 | 4 | 1 | 451 | 421 | 2 | 7 | 1 | 91 | -46 | 2 | 0 | 2 | 142 | 97 | 4 | 3 | 2 | 419 | -386 | 4 | 6 | 2 | 199 | 189 |
| 8 | 5 | 0 | 48- | 25 | 2 | 1 | 1 | 634 | -558 | 2 | 4 | 1 | 27- | 25 | 2 | 7 | 1 | 506 | 564 | 2 | 0 | 2 | 680 | -787 | 4 | 3 | 2 | 491 | 476 | 4 | 6 | 2 | 634 | -662 |
| 8 | 5 | 0 | 68- | 92 | 2 | 1 | 1 | 162 | 114 | 2 | 4 | 1 | 108 | 85 | 2 | 7 | 1 | 177 | -172 | 3 | 0 | 2 | 485 | 462 | 4 | 3 | 2 | 110 | -79 | 4 | 6 | 2 | 48- | -67 |
| 0 | 6 | 0 | 505 | -511 | 3 | 1 | 1 | 511 | 461 | 2 | 4 | 1 | 1025 | 955 | 3 | 7 | 1 | 297 | -292 | 3 | 0 | 2 | 725 | -788 | 5 | 3 | 2 | 85 | 47 | 4 | 6 | 2 | 799 | 748 |
| 1 | 6 | 0 | 294 | 292 | 3 | 1 | 1 | 571 | -592 | 3 | 4 | 1 | 180 | -165 | 3 | 7 | 1 | 414 | 415 | 4 | 0 | 2 | 508 | 505 | 5 | 3 | 2 | 91 | 88 | 5 | 6 | 2 | 422 | 427 |
| 1 | 6 | 0 | 397 | -473 | 3 | 1 | 1 | 642 | -640 | 3 | 4 | 1 | 731 | -702 | 3 | 7 | 1 | 114 | -114 | 4 | 0 | 2 | 652 | -699 | 5 | 3 | 2 | 62- | -9 | 5 | 6 | 2 | 154 | -137 |
| 2 | 6 | 0 | 282 | 295 | 3 | 1 | 1 | 785 | -871 | 3 | 4 | 1 | 574 | 535 | 3 | 7 | 1 | 88- | -38 | 5 | 0 | 2 | 394 | -378 | 5 | 3 | 2 | 471 | -410 | 5 | 6 | 2 | 297 | -327 |

**Table III.** (Continued)

| h | k | l | $10F_o$ | $10F_c$ | h | k | l | $10F_o$ | $10F_c$ | h | k | l | $10F_o$ | $10F_c$ | h | k | l | $10F_o$ | $10F_c$ | h | k | l | $10F_o$ | $10F_c$ | h | k | l | $10F_o$ | $10F_c$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | 5 | 2 | 268 | 221 | 0 | 11 | 2 | 257 | -236 | 10 | 2 | 3 | 172 | 231 | 0 | 6 | 3 | 505 | 473 | 3 | 9 | 3 | 79- | -10 | 6 | 2 | 4 | 302 | 300 | 5 | 5 | 4 | 157 | 140 |
| 6 | 6 | 2 | 142 | -147 | 0 | 11 | 2 | 119 | 154 | 0 | 3 | 3 | 68- | 15 | 0 | 6 | 3 | 351 | 295 | 3 | 5 | 3 | 88- | -44 | 6 | 2 | 4 | 565 | -593 | 5 | 5 | 4 | 222 | 193 |
| 6 | 5 | 2 | 245 | 250 | 1 | 11 | 2 | 25- | 22 | 0 | 3 | 3 | 828 | 903 | 1 | 6 | 3 | 105 | 43 | 4 | 5 | 3 | 174 | 167 | 6 | 2 | 4 | 225 | 221 | 5 | 5 | 4 | 259 | 275 |
| 6 | 6 | 2 | 82 | -91 | 1 | 11 | 2 | 74 | -59 | 1 | 3 | 3 | 1054 | 1041 | 1 | 5 | 3 | 291 | 300 | 5 | 5 | 3 | 202 | -217 | 6 | 2 | 4 | 359 | -406 | 5 | 5 | 4 | 348 | 298 |
| 6 | 5 | 2 | 337 | -294 | 1 | 11 | 2 | 39- | 11 | 1 | 3 | 3 | 477 | -435 | 1 | 6 | 3 | 423 | -450 | 5 | 5 | 3 | 65- | 55 | 7 | 2 | 4 | 291 | -276 | 6 | 5 | 4 | 242 | -219 |
| 7 | 6 | 2 | 51 | -82 | 1 | 11 | 2 | 39- | -19 | 1 | 3 | 3 | 308 | 316 | 1 | 5 | 3 | 357 | 327 | 6 | 5 | 3 | 79 | 90 | 7 | 2 | 4 | 174 | 152 | 6 | 5 | 4 | 91 | -81 |
| 7 | 5 | 2 | 131 | 126 | 2 | 11 | 2 | 102 | -118 | 1 | 3 | 3 | 408 | -395 | 2 | 6 | 3 | 225 | -219 | 6 | 5 | 3 | 177 | 187 | 7 | 2 | 4 | 225 | 234 | 6 | 5 | 4 | 460 | -484 |
| 7 | 6 | 2 | 257 | 271 | 2 | 11 | 2 | 51- | 45 | 2 | 3 | 3 | 779 | 730 | 2 | 5 | 3 | 451 | 434 | 7 | 5 | 3 | 251 | 270 | 7 | 2 | 4 | 128 | -89 | 6 | 5 | 4 | 214 | 184 |
| 7 | 5 | 2 | 128 | -127 | 3 | 11 | 2 | 42- | -34 | 2 | 3 | 3 | 857 | -896 | 2 | 6 | 3 | 68- | -49 | 0 | 10 | 3 | 117 | -142 | 8 | 2 | 4 | 39- | 5 | 7 | 5 | 4 | 168 | -157 |
| 8 | 6 | 2 | 88 | 87 | 3 | 11 | 2 | 48- | 56 | 2 | 3 | 3 | 91 | -63 | 2 | 5 | 3 | 328 | -326 | 0 | 10 | 3 | 251 | -243 | 8 | 2 | 4 | 45- | 59 | 7 | 5 | 4 | 314 | -325 |
| 8 | 5 | 2 | 62- | 67 | 0 | 0 | 3 | 983 | -963 | 2 | 3 | 3 | 308 | -279 | 3 | 6 | 3 | 111 | -29 | 1 | 10 | 3 | 45- | -52 | 8 | 2 | 4 | 154 | -154 | 7 | 5 | 4 | 382 | -360 |
| 10 | 5 | 2 | 22- | -16 | 1 | 0 | 3 | 913 | -961 | 3 | 3 | 3 | 514 | -454 | 3 | 5 | 3 | 228 | -242 | 1 | 10 | 3 | 208 | -225 | 8 | 2 | 4 | 111- | 407 | 8 | 5 | 4 | 25- | -42 |
| 0 | 7 | 2 | 239 | 248 | 1 | 0 | 3 | 672 | 738 | 3 | 3 | 3 | 311 | -250 | 3 | 6 | 3 | 645 | 779 | 1 | 10 | 3 | 242 | -259 | 9 | 2 | 4 | 65- | -28 | 8 | 5 | 4 | 62- | -13 |
| 0 | 7 | 2 | 331 | -324 | 2 | 0 | 3 | 84 | 39 | 3 | 3 | 3 | 111 | -117 | 3 | 5 | 3 | 357 | -347 | 2 | 10 | 3 | 168 | -188 | 10 | 2 | 4 | 297 | 306 | 8 | 5 | 4 | 74- | -80 |
| 1 | 7 | 2 | 131 | -91 | 2 | 0 | 3 | 374 | 347 | 3 | 3 | 3 | 768 | 682 | 4 | 6 | 3 | 365 | 369 | 2 | 10 | 3 | 74- | 85 | 0 | 3 | 4 | 99 | 58 | 9 | 5 | 4 | 105 | 93 |
| 1 | 7 | 2 | 119 | 73 | 3 | 0 | 3 | 139 | 121 | 4 | 3 | 3 | 139 | -136 | 4 | 5 | 3 | 137 | -132 | 3 | 10 | 3 | 62- | 84 | 0 | 3 | 4 | 239 | 213 | 0 | 6 | 4 | 197 | 145 |
| 1 | 7 | 2 | 54 | -37 | 3 | 0 | 3 | 362 | -330 | 4 | 3 | 3 | 94 | 62 | 4 | 6 | 3 | 377 | 420 | 3 | 10 | 3 | 68- | -23 | 1 | 3 | 4 | 622 | 532 | 0 | 6 | 4 | 437 | 387 |
| 1 | 7 | 2 | 251 | -198 | 4 | 0 | 3 | 325 | -285 | 4 | 3 | 3 | 382 | 361 | 4 | 5 | 3 | 165 | 160 | 4 | 10 | 3 | 191 | 204 | 1 | 3 | 4 | 634 | -612 | 1 | 6 | 4 | 139 | -127 |
| 2 | 7 | 2 | 597 | -625 | 4 | 0 | 3 | 543 | -558 | 4 | 3 | 3 | 302 | 253 | 5 | 6 | 3 | 65- | 66 | 4 | 10 | 3 | 219 | -225 | 1 | 3 | 4 | 611 | 617 | 1 | 5 | 4 | 274 | 248 |
| 2 | 7 | 2 | 499 | 538 | 5 | 0 | 3 | 502 | -481 | 5 | 3 | 3 | 222 | 212 | 5 | 5 | 3 | 357 | 393 | 5 | 10 | 3 | 257 | -286 | 1 | 3 | 4 | 131 | -130 | 1 | 6 | 4 | 105 | -96 |
| 2 | 7 | 2 | 371 | 450 | 5 | 0 | 3 | 789 | -875 | 5 | 3 | 3 | 414 | 379 | 5 | 6 | 3 | 62- | -43 | 6 | 10 | 3 | 19- | 26 | 2 | 3 | 4 | 651 | -591 | 1 | 5 | 4 | 739 | 747 |
| 2 | 7 | 2 | 439 | -463 | 6 | 0 | 3 | 277 | -264 | 5 | 3 | 3 | 488 | 491 | 5 | 5 | 3 | 688 | 664 | 0 | 11 | 3 | 51- | 50 | 2 | 3 | 4 | 71- | -55 | 2 | 6 | 4 | 245 | -217 |
| 3 | 7 | 2 | 179 | 66 | 6 | 0 | 3 | 371 | 357 | 5 | 3 | 3 | 834 | -773 | 6 | 6 | 3 | 437 | -421 | 1 | 11 | 3 | 179 | -180 | 2 | 3 | 4 | 131 | 110 | 2 | 5 | 4 | 202 | 162 |
| 3 | 7 | 2 | 334 | 307 | 7 | 0 | 3 | 371 | 375 | 6 | 3 | 3 | 285 | 258 | 6 | 5 | 3 | 360 | 338 | 2 | 11 | 3 | 191 | -216 | 2 | 3 | 4 | 559 | -569 | 2 | 6 | 4 | 542 | -631 |
| 3 | 7 | 2 | 157 | -159 | 7 | 0 | 3 | 48 | 58 | 6 | 3 | 3 | 374 | -357 | 6 | 6 | 3 | 108 | -116 | 0 | 0 | 4 | 1150 | -1216 | 3 | 3 | 4 | 699 | -665 | 2 | 5 | 4 | 422 | 381 |
| 3 | 7 | 2 | 499 | -502 | 8 | 0 | 3 | 359 | 428 | 6 | 3 | 3 | 194 | 180 | 6 | 5 | 3 | 57- | 11 | 1 | 0 | 4 | 439 | -405 | 3 | 3 | 4 | 391 | 380 | 3 | 6 | 4 | 82- | 73 |
| 4 | 7 | 2 | 151 | 143 | 8 | 0 | 3 | 339 | -332 | 6 | 3 | 3 | 471 | -442 | 7 | 5 | 3 | 48- | 42 | 1 | 0 | 4 | 422 | -474 | 3 | 3 | 4 | 237 | -224 | 3 | 5 | 4 | 239 | -251 |
| 4 | 7 | 2 | 219 | -215 | 9 | 0 | 3 | 188 | -220 | 7 | 3 | 3 | 62- | -5 | 7 | 6 | 3 | 105 | 91 | 2 | 0 | 4 | 634 | 644 | 3 | 3 | 4 | 71- | -25 | 3 | 6 | 4 | 179 | 201 |
| 4 | 7 | 2 | 199 | -225 | 9 | 0 | 3 | 99 | -109 | 7 | 3 | 3 | 262 | -220 | 7 | 5 | 3 | 162 | -145 | 2 | 0 | 4 | 597 | 670 | 4 | 3 | 4 | 111 | 63 | 3 | 5 | 4 | 199 | -206 |
| 4 | 7 | 2 | 188 | 163 | 10 | 0 | 3 | 97 | 97 | 7 | 3 | 3 | 329 | -329 | 8 | 6 | 3 | 94 | 103 | 3 | 0 | 4 | 131 | 93 | 4 | 3 | 4 | 511 | 469 | 4 | 6 | 4 | 339 | 348 |
| 5 | 7 | 2 | 111 | 66 | 11 | 0 | 3 | 222 | 282 | 7 | 3 | 3 | 68- | -1 | 8 | 5 | 3 | 65- | -45 | 3 | 0 | 4 | 414 | 392 | 4 | 3 | 4 | 148 | 113 | 4 | 5 | 4 | 20- | 6 |
| 5 | 7 | 2 | 282 | -286 | 0 | 1 | 3 | 1396 | -1469 | 8 | 3 | 3 | 194 | -176 | 0 | 7 | 3 | 374 | 365 | 4 | 0 | 4 | 674 | -699 | 4 | 3 | 4 | 711 | 699 | 4 | 6 | 4 | 48- | 71 |
| 5 | 7 | 2 | 102 | -98 | 0 | 1 | 3 | 112 | -94 | 8 | 3 | 3 | 234 | -222 | 0 | 7 | 3 | 174 | -201 | 4 | 0 | 4 | 102 | 80 | 5 | 3 | 4 | 465 | 424 | 4 | 5 | 4 | 222 | -213 |
| 5 | 7 | 2 | 534 | 525 | 1 | 1 | 3 | 171 | 133 | 9 | 3 | 3 | 359 | 361 | 1 | 7 | 3 | 391 | -391 | 5 | 0 | 4 | 77- | -21 | 5 | 3 | 4 | 114 | 94 | 5 | 6 | 4 | 288 | -277 |
| 6 | 7 | 2 | 251 | -238 | 1 | 1 | 3 | 397 | -345 | 10 | 3 | 3 | 71 | 81 | 1 | 7 | 3 | 302 | 290 | 5 | 0 | 4 | 328 | -329 | 5 | 3 | 4 | 735 | 760 | 5 | 5 | 4 | 377 | 390 |
| 6 | 7 | 2 | 51- | -51 | 1 | 1 | 3 | 85 | -19 | 0 | 4 | 3 | 828 | 751 | 1 | 7 | 3 | 154 | -152 | 6 | 0 | 4 | 225 | 206 | 5 | 3 | 4 | 68- | -51 | 5 | 6 | 4 | 105 | -64 |
| 6 | 7 | 2 | 74 | 63 | 1 | 1 | 3 | 325 | -290 | 0 | 4 | 3 | 737 | 748 | 1 | 7 | 3 | 297 | 283 | 6 | 0 | 4 | 274 | 305 | 6 | 3 | 4 | 317 | 294 | 5 | 5 | 4 | 419 | 373 |
| 6 | 7 | 2 | 68- | 5 | 2 | 1 | 3 | 294 | 261 | 1 | 4 | 3 | 831 | 761 | 2 | 7 | 3 | 245 | -240 | 7 | 0 | 4 | 357 | 362 | 6 | 3 | 4 | 574 | -591 | 6 | 6 | 4 | 171 | -162 |
| 7 | 7 | 2 | 302 | 292 | 2 | 1 | 3 | 522 | -524 | 1 | 4 | 3 | 291 | 251 | 2 | 7 | 3 | 397 | 384 | 7 | 0 | 4 | 475 | 511 | 6 | 3 | 4 | 417 | 407 | 6 | 5 | 4 | 162 | 128 |
| 7 | 7 | 2 | 428 | 394 | 2 | 1 | 3 | 51- | 30 | 1 | 4 | 3 | 371 | -342 | 2 | 7 | 3 | 328 | 323 | 8 | 0 | 4 | 37- | 2 | 6 | 3 | 4 | 571 | -587 | 6 | 6 | 4 | 91 | -113 |
| 7 | 7 | 2 | 131 | -136 | 2 | 1 | 3 | 528 | 525 | 1 | 4 | 3 | 222 | -186 | 2 | 7 | 3 | 119 | 131 | 8 | 0 | 4 | 177 | -167 | 7 | 3 | 4 | 99 | -100 | 6 | 5 | 4 | 139 | 107 |
| 8 | 7 | 2 | 79- | 59 | 3 | 1 | 3 | 348 | 275 | 2 | 4 | 3 | 265 | -220 | 3 | 7 | 3 | 122 | 92 | 9 | 0 | 4 | 219 | -217 | 7 | 3 | 4 | 74 | -54 | 7 | 5 | 4 | 271 | -244 |
| 0 | 8 | 2 | 185 | 188 | 3 | 1 | 3 | 671 | 701 | 2 | 4 | 3 | 574 | -538 | 3 | 7 | 3 | 191 | -177 | 10 | 0 | 4 | 88 | -92 | 7 | 3 | 4 | 131 | 121 | 7 | 6 | 4 | 234 | -205 |
| 0 | 8 | 2 | 145 | -147 | 3 | 1 | 3 | 781 | -790 | 2 | 4 | 3 | 379 | -372 | 3 | 7 | 3 | 457 | 506 | 11 | 0 | 4 | 142 | 133 | 7 | 3 | 4 | 394 | -374 | 7 | 5 | 4 | 171 | -136 |
| 1 | 8 | 2 | 362 | -412 | 3 | 1 | 3 | 157 | 175 | 2 | 4 | 3 | 562 | -484 | 3 | 7 | 3 | 371 | -381 | 0 | 1 | 4 | 537 | -463 | 8 | 3 | 4 | 188 | -199 | 8 | 6 | 4 | 237 | 233 |
| 1 | 8 | 2 | 408 | -431 | 4 | 1 | 3 | 268 | -230 | 3 | 4 | 3 | 577 | -559 | 4 | 7 | 3 | 119 | 141 | 0 | 1 | 4 | 492 | -680 | 9 | 3 | 4 | 117 | 114 | 9 | 5 | 4 | 59- | -56 |
| 1 | 8 | 2 | 145 | 154 | 4 | 1 | 3 | 114 | 105 | 3 | 4 | 3 | 437 | -382 | 4 | 7 | 3 | 157 | -142 | 1 | 1 | 4 | 837 | 756 | 10 | 3 | 4 | 174 | 174 | 0 | 7 | 4 | 102- | 11 |
| 1 | 8 | 2 | 248 | 277 | 4 | 1 | 3 | 704 | -700 | 3 | 4 | 3 | 222 | -201 | 4 | 7 | 3 | 119 | -126 | 1 | 1 | 4 | 899 | -1015 | 0 | 4 | 4 | 588 | 515 | 0 | 7 | 4 | 191 | -132 |
| 2 | 8 | 2 | 239 | -252 | 4 | 1 | 3 | 431 | -404 | 3 | 4 | 3 | 751 | 681 | 4 | 7 | 3 | 437 | -413 | 1 | 1 | 4 | 77 | 44 | 0 | 4 | 4 | 848 | 865 | 1 | 7 | 4 | 362 | -346 |
| 2 | 8 | 2 | 357 | 336 | 5 | 1 | 3 | 442 | -418 | 4 | 4 | 3 | 79 | 56 | 5 | 7 | 3 | 248 | -229 | 1 | 1 | 4 | 861 | -884 | 1 | 4 | 4 | 262 | 206 | 1 | 7 | 4 | 291 | 292 |
| 2 | 8 | 2 | 251 | 288 | 5 | 1 | 3 | 471 | -519 | 4 | 4 | 3 | 139 | -5 | 5 | 7 | 3 | 91 | -29 | 2 | 1 | 4 | 497 | 450 | 1 | 4 | 4 | 311 | -273 | 1 | 7 | 4 | 497 | -554 |
| 2 | 8 | 2 | 137 | -127 | 5 | 1 | 3 | 259 | 226 | 4 | 4 | 3 | 274 | 254 | 5 | 7 | 3 | 259 | -254 | 2 | 1 | 4 | 131 | 59 | 1 | 4 | 4 | 197 | 210 | 1 | 7 | 4 | 362 | 354 |
| 3 | 8 | 2 | 94- | 71 | 5 | 1 | 3 | 557 | -545 | 4 | 4 | 3 | 242 | 201 | 5 | 7 | 3 | 314 | 308 | 2 | 1 | 4 | 918 | 935 | 1 | 4 | 4 | 131 | -114 | 2 | 7 | 4 | 169 | 127 |
| 3 | 8 | 2 | 439 | 449 | 6 | 1 | 3 | 445 | 432 | 5 | 4 | 3 | 319 | 298 | 6 | 7 | 3 | 279 | -283 | 2 | 1 | 4 | 422 | 429 | 2 | 4 | 4 | 465 | -433 | 2 | 7 | 4 | 202 | 189 |
| 3 | 8 | 2 | 94 | -34 | 6 | 1 | 3 | 377 | -379 | 5 | 4 | 3 | 97 | 83 | 6 | 7 | 3 | 274 | 279 | 3 | 1 | 4 | 111 | 48 | 2 | 4 | 4 | 419 | -376 | 2 | 7 | 4 | 337 | -330 |
| 3 | 8 | 2 | 468 | -520 | 6 | 1 | 3 | 606 | 593 | 5 | 4 | 3 | 285 | 291 | 6 | 7 | 3 | 268 | -268 | 3 | 1 | 4 | 445 | 439 | 2 | 4 | 4 | 61- | -15 | 2 | 7 | 4 | 399 | 396 |
| 4 | 8 | 2 | 65- | 64 | 6 | 1 | 3 | 68 | 78 | 5 | 4 | 3 | 97 | 78 | 6 | 7 | 3 | 111 | 77 | 3 | 1 | 4 | 262 | -207 | 2 | 4 | 4 | 434 | -434 | 3 | 7 | 4 | 259 | 279 |
| 4 | 8 | 2 | 168 | 120 | 7 | 1 | 3 | 508 | 503 | 6 | 4 | 3 | 331 | 322 | 7 | 7 | 3 | 288 | 253 | 3 | 1 | 4 | 237 | 251 | 3 | 4 | 4 | 234 | 189 | 3 | 7 | 4 | 205 | -185 |
| 4 | 8 | 2 | 159 | -194 | 7 | 1 | 3 | 68- | -16 | 6 | 4 | 3 | 297 | -265 | 7 | 7 | 3 | 168 | 184 | 4 | 1 | 4 | 537 | -527 | 3 | 4 | 4 | 74- | 40 | 3 | 7 | 4 | 179 | 188 |
| 4 | 8 | 2 | 125 | -108 | 7 | 1 | 3 | 57- | 45 | 6 | 4 | 3 | 348 | -337 | 7 | 7 | 3 | 102 | -104 | 4 | 1 | 4 | 679 | -659 | 3 | 4 | 4 | 71 | -70 | 3 | 7 | 4 | 174 | 152 |
| 5 | 8 | 2 | 128 | -88 | 7 | 1 | 3 | 57- | 116 | 6 | 4 | 3 | 600 | -569 | 8 | 7 | 3 | 82 | 71 | 4 | 1 | 4 | 766 | -757 | 3 | 4 | 4 | 308 | -247 | 4 | 7 | 4 | 114 | 94 |
| 5 | 8 | 2 | 148 | -139 | 8 | 1 | 3 | 57- | 54 | 7 | 4 | 3 | 168 | -157 | 8 | 7 | 3 | 79- | -119 | 4 | 1 | 4 | 131 | -128 | 4 | 4 | 4 | 568 | 519 | 4 | 7 | 4 | 117 | 48 |
| 5 | 8 | 2 | 71- | 76 | 8 | 1 | 3 | 65- | -105 | 7 | 4 | 3 | 385 | -349 | 0 | 8 | 3 | 137 | -143 | 5 | 1 | 4 | 88- | 42 | 4 | 4 | 4 | 542 | 509 | 4 | 7 | 4 | 102 | 64 |
| 5 | 8 | 2 | 125 | 111 | 8 | 1 | 3 | 94- | -68 | 7 | 4 | 3 | 219 | -235 | 0 | 8 | 3 | 299 | -277 | 5 | 1 | 4 | 434 | -404 | 4 | 4 | 4 | 48- | 11 | 4 | 7 | 4 | 171 | -151 |
| 6 | 8 | 2 | 102 | -112 | 9 | 1 | 3 | 19- | -237 | 7 | 4 | 3 | 285 | -274 | 1 | 8 | 3 | 525 | -533 | 5 | 1 | 4 | 222 | -229 | 4 | 4 | 4 | 237 | 245 | 5 | 7 | 4 | 151 | -163 |
| 6 | 8 | 2 | 128 | 164 | 9 | 1 | 3 | 57- | 17 | 8 | 4 | 3 | 139 | 171 | 1 | 8 | 3 | 74- | 45 | 5 | 1 | 4 | 491 | -515 | 5 | 4 | 4 | 348 | 320 | 5 | 7 | 4 | 168 | 181 |
| 6 | 8 | 2 | 194 | 186 | 10 | 1 | 3 | 148 | 153 | 9 | 4 | 3 | 348 | 344 | 1 | 8 | 3 | 91 | 53 | 6 | 1 | 4 | 425 | 411 | 5 | 4 | 4 | 377 | 347 | 5 | 7 | 4 | 99 | -65 |
| 7 | 8 | 2 | 237 | 219 | 0 | 2 | 3 | 597 | -530 | 10 | 4 | 3 | 17- | 34 | 1 | 8 | 3 | 142 | 178 | 6 | 1 | 4 | 148 | -150 | 5 | 4 | 4 | 718 | 721 | 5 | 7 | 4 | 257 | 217 |
| 7 | 8 | 2 | 85 | 112 | 0 | 2 | 3 | 137 | -122 | 0 | 5 | 3 | 714 | 685 | 2 | 8 | 3 | 97- | -74 | 6 | 1 | 4 | 234 | 244 | 5 | 4 | 4 | 445 | 400 | 6 | 7 | 4 | 417 | 438 |
| 7 | 8 | 2 | 134 | -129 | 1 | 2 | 3 | 277 | 213 | 0 | 5 | 3 | 542 | 508 | 2 | 8 | 3 | 545 | 573 | 6 | 1 | 4 | 91 | -135 | 6 | 4 | 4 | 245 | 211 | 6 | 7 | 4 | 268 | -234 |
| 0 | 9 | 2 | 177 | -194 | 1 | 2 | 3 | 222 | -242 | 1 | 5 | 3 | 194 | -137 | 2 | 8 | 3 | 108 | 71 | 7 | 1 | 4 | 65- | -40 | 6 | 4 | 4 | 94 | -84 | 6 | 7 | 4 | 317 | 327 |
| 0 | 9 | 2 | 157 | 139 | 1 | 2 | 3 | 454 | 468 | 1 | 5 | 3 | 511 | 485 | 2 | 8 | 3 | 254 | 267 | 7 | 1 | 4 | 334 | 270 | 6 | 4 | 4 | 45- | 45 | 7 | 7 | 4 | 34- | -25 |
| 1 | 5 | 2 | 279 | -281 | 1 | 2 | 3 | 619 | -594 | 1 | 5 | 3 | 288 | -272 | 3 | 8 | 3 | 117 | 66 | 7 | 1 | 4 | 197 | 222 | 6 | 4 | 4 | 265 | -250 | 7 | 7 | 4 | 131 | -80 |
| 1 | 5 | 2 | 259 | 289 | 2 | 2 | 3 | 894 | 898 | 1 | 5 | 3 | 68- | -47 | 3 | 8 | 3 | 94 | 20 | 7 | 1 | 4 | 501 | 509 | 7 | 4 | 4 | 345 | -336 | 7 | 7 | 4 | 100 | -47 |
| 2 | 5 | 2 | 159 | -166 | 2 | 2 | 3 | 571 | -570 | 2 | 5 | 3 | 257 | -211 | 3 | 8 | 3 | 88- | 20 | 8 | 1 | 4 | 265 | -280 | 7 | 4 | 4 | 139 | -129 | 8 | 7 | 4 | 239 | 210 |
| 2 | 5 | 2 | 182 | 213 | 2 | 2 | 3 | 259 | 258 | 2 | 5 | 3 | 142 | 129 | 3 | 8 | 3 | 99- | -77 | 8 | 1 | 4 | 234 | -219 | 7 | 4 | 4 | 377 | -405 | 0 | 8 | 4 | 337 | -343 |
| 3 | 5 | 2 | 222 | 242 | 2 | 2 | 3 | 331 | -299 | 2 | 5 | 3 | 442 | -458 | 4 | 8 | 3 | 137 | -114 | 9 | 1 | 4 | 57- | -67 | 7 | 4 | 4 | 608 | -606 | 0 | 8 | 4 | 432 | -415 |
| 3 | 9 | 2 | 82- | -98 | 3 | 2 | 3 | 171 | 163 | 2 | 5 | 3 | 457 | -437 | 4 | 8 | 3 | 142 | -136 | 10 | 1 | 4 | 137 | 75 | 8 | 4 | 4 | 25- | 28 | 1 | 8 | 4 | 228 | -203 |
| 3 | 5 | 2 | 299 | -331 | 3 | 2 | 3 | 322 | 334 | 3 | 5 | 3 | 311 | -296 | 4 | 8 | 3 | 342 | -337 | 0 | 2 | 4 | 122 | 108 | 8 | 4 | 4 | 94 | -68 | 1 | 8 | 4 | 151 | 131 |
| 4 | 9 | 2 | 31- | 44 | 3 | 2 | 3 | 662 | -649 | 3 | 5 | 3 | 388 | -375 | 4 | 8 | 3 | 82 | -92 | 0 | 2 | 4 | 199 | 178 | 8 | 4 | 4 | 62- | 82 | 1 | 8 | 4 | 77- | -19 |
| 4 | 5 | 2 | 234 | 240 | 3 | 2 | 3 | 899 | 911 | 3 | 5 | 3 | 125 | 127 | 5 | 8 | 3 | 45- | -78 | 1 | 2 | 4 | 565 | 537 | 9 | 4 | 4 | 37- | 22 | 1 | 8 | 4 | 122 | 117 |
| 4 | 5 | 2 | 168 | -167 | 4 | 2 | 3 | 282 | -260 | 3 | 5 | 3 | 411 | 362 | 5 | 8 | 3 | 162 | -181 | 1 | 2 | 4 | 505 | -487 | 9 | 4 | 4 | 54- | 102 | 2 | 8 | 4 | 251 | 265 |
| 5 | 5 | 2 | 59- | -66 | 4 | 2 | 3 | 711 | 697 | 4 | 5 | 3 | 437 | 409 | 5 | 8 | 3 | 397 | -411 | 1 | 2 | 4 | 522 | 542 | 0 | 5 | 4 | 371 | 344 | 2 | 8 | 4 | 219 | 203 |
| 5 | 5 | 2 | 68- | -34 | 4 | 2 | 3 | 385 | 341 | 4 | 5 | 3 | 62- | 47 | 5 | 8 | 3 | 157 | 155 | 1 | 2 | 4 | 928 | -984 | 0 | 5 | 4 | 657 | 615 | 2 | 8 | 4 | 85- | -43 |
| 6 | 5 | 2 | 54 | -19 | 4 | 2 | 3 | 382 | -392 | 4 | 5 | 3 | 431 | 440 | 6 | 8 | 3 | 71 | 71 | 2 | 2 | 4 | 125 | 112 | 1 | 5 | 4 | 128 | 77 | 2 | 8 | 4 | 114 | 141 |
| 6 | 5 | 2 | 88 | 65 | 5 | 2 | 3 | 234 | 192 | 4 | 5 | 3 | 677 | 641 | 6 | 8 | 3 | 97 | 31 | 2 | 2 | 4 | 108 | 88 | 1 | 5 | 4 | 439 | 391 | 3 | 8 | 4 | 165 | 159 |
| 7 | 5 | 2 | 145 | -132 | 5 | 2 | 3 | 77- | 13 | 5 | 5 | 3 | 399 | 405 | 6 | 8 | 3 | 262 | 283 | 2 | 2 | 4 | 657 | 701 | 1 | 5 | 4 | 308 | 320 | 3 | 8 | 4 | 242 | -229 |
| 0 | 10 | 2 | 222 | -264 | 5 | 2 | 3 | 468 | 474 | 5 | 5 | 3 | 477 | 468 | 7 | 8 | 3 | 234 | 277 | 2 | 2 | 4 | 617 | -575 | 1 | 5 | 4 | 554 | 548 | 3 | 8 | 4 | 299 | 331 |
| 0 | 10 | 2 | 188 | 203 | 5 | 2 | 3 | 685 | -642 | 5 | 5 | 3 | 77- | 16 | 7 | 8 | 3 | 111 | 145 | 3 | 2 | 4 | 342 | -291 | 2 | 5 | 4 | 100 | -45 | 3 | 8 | 4 | 101 | 47 |
| 1 | 10 | 2 | 59- | -75 | 6 | 2 | 3 | 582 | 617 | 5 | 5 | 3 | 585 | 544 | 7 | 8 | 3 | 97 | 98 | 3 | 2 | 4 | 337 | 311 | 2 | 5 | 4 | 71- | -44 | 4 | 8 | 4 | 45- | -3 |
| 1 | 10 | 2 | 59- | 10 | 6 | 2 | 3 | 565 | -577 | 6 | 5 | 3 | 82 | -69 | 9 | 8 | 3 | 22- | 8 | 3 | 2 | 4 | 726 | -733 | 2 | 5 | 4 | 191 | -199 | 4 | 8 | 4 | 197 | -201 |
| 2 | 10 | 2 | 74- | -35 | 6 | 2 | 3 | 439 | 430 | 6 | 5 | 3 | 145 | -134 | 0 | 9 | 3 | 262 | -295 | 3 | 2 | 4 | 422 | 358 | 2 | 5 | 4 | 539 | -553 | 4 | 8 | 4 | 62- | 22 |
| 2 | 10 | 2 | 88 | 131 | 6 | 2 | 3 | 245 | 237 | 6 | 5 | 3 | 271 | -275 | 0 | 9 | 3 | 328 | -308 | 4 | 2 | 4 | 714 | -682 | 3 | 5 | 4 | 185 | 150 | 4 | 8 | 4 | 197 | -218 |
| 3 | 10 | 2 | 68- | 37 | 7 | 2 | 3 | 79- | 18 | 6 | 5 | 3 | 82 | -42 | 1 | 9 | 3 | 242 | -234 | 4 | 2 | 4 | 108 | -37 | 3 | 5 | 4 | 439 | -420 | 5 | 8 | 4 | 59- | 57 |
| 3 | 10 | 2 | 79 | -82 | 7 | 2 | 3 | 74- | -50 | 7 | 5 | 3 | 291 | -284 | 1 | 9 | 3 | 71- | 6 | 4 | 2 | 4 | 525 | -543 | 3 | 5 | 4 | 79- | -13 | 5 | 8 | 4 | 362 | -400 |
| 4 | 10 | 2 | 279 | 283 | 7 | 2 | 3 | 71- | 24 | 7 | 5 | 3 | 151 | -208 | 1 | 9 | 3 | 68- | -41 | 4 | 2 | 4 | 219 | 192 | 3 | 5 | 4 | 594 | -592 | 5 | 8 | 4 | 91- | 45 |
| 4 | 10 | 2 | 225 | -243 | 7 | 2 | 3 | 228 | 235 | 7 | 5 | 3 | 154 | 144 | 2 | 9 | 3 | 219 | 212 | 5 | 2 | 4 | 342 | 311 | 4 | 5 | 4 | 419 | 401 | 6 | 8 | 4 | 259 | 263 |
| 5 | 10 | 2 | 82 | -16 | 8 | 2 | 3 | 99 | -123 | 7 | 5 | 3 | 254 | -246 | 2 | 9 | 3 | 88- | 79 | 5 | 2 | 4 | 645 | -631 | 4 | 5 | 4 | 362 | 310 | 6 | 8 | 4 | 188 | -166 |
| 5 | 10 | 2 | 79 | -101 | 8 | 2 | 3 | 222 | -236 | 8 | 5 | 3 | 168 | 168 | 2 | 5 | 3 | 262 | 304 | 5 | 2 | 4 | 425 | 416 | 4 | 5 | 4 | 134 | 161 | 6 | 8 | 4 | 242 | 274 |
| 6 | 10 | 2 | 174 | 194 | 9 | 2 | 3 | 122 | 133 | 9 | 5 | 3 | 182 | 171 | 3 | 5 | 3 | 302 | 336 | 5 | 2 | 4 | 744 | -776 | 4 | 3 | 4 | 62- | -18 | 7 | 8 | 4 | 45- | 24 |

**Table III.** (Continued)

| h | k | l | $10F_o$ | $10F_c$ | h | k | l | $10F_o$ | $10F_c$ | h | k | l | $10F_o$ | $10F_c$ | h | k | l | $10F_o$ | $10F_c$ | h | k | l | $10F_o$ | $10F_c$ | h | k | l | $10F_o$ | $10F_c$ | h | k | l | $10F_o$ | $10F_c$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7 | 8 | 4 | 328 | 363 | 3 | 2 | 5 | 254 | -232 | 4 | 5 | 5 | 297 | 287 | 0 | 9 | 5 | 294 | -272 | 6 | 2 | 6 | 85 | 69 | 7 | 5 | 6 | 111 | 115 | 3 | 0 | 7 | 311 | -305 |
| 8 | 8 | 4 | 71- | -38 | 4 | 2 | 5 | 160 | -131 | 4 | 5 | 5 | 671 | 650 | 1 | 9 | 5 | 122 | -92 | 6 | 2 | 6 | 94 | 72 | 8 | 5 | 6 | 114 | -118 | 3 | 0 | 7 | 97 | 62 |
| 0 | 9 | 4 | 154 | -168 | 4 | 2 | 5 | 228 | -227 | 4 | 5 | 5 | 262 | 253 | 1 | 9 | 5 | 142 | -170 | 7 | 2 | 6 | 114 | 103 | 8 | 5 | 6 | 297 | -372 | 4 | 0 | 7 | 422 | 411 |
| 0 | 9 | 4 | 228 | -223 | 4 | 2 | 5 | 411 | -429 | 4 | 5 | 5 | 202 | -186 | 2 | 9 | 5 | 108 | -72 | 7 | 2 | 6 | 274 | 290 | 9 | 5 | 6 | 45- | 7 | 4 | 0 | 7 | 448 | 485 |
| 1 | 9 | 4 | 57- | -48 | 4 | 2 | 5 | 598 | 594 | 5 | 5 | 5 | 57- | -24 | 2 | 9 | 5 | 74- | 116 | 7 | 2 | 6 | 91- | 8 | 0 | 6 | 6 | 308 | -285 | 5 | 0 | 7 | 242 | 236 |
| 1 | 9 | 4 | 68- | 3 | 5 | 2 | 5 | 429 | 440 | 5 | 5 | 5 | 68- | 21 | 3 | 9 | 5 | 119 | -107 | 8 | 2 | 6 | 134 | 142 | 0 | 6 | 6 | 88 | -52 | 5 | 0 | 7 | 514 | 516 |
| 1 | 9 | 4 | 68- | -78 | 5 | 2 | 5 | 534 | -538 | 5 | 5 | 5 | 382 | 407 | 3 | 9 | 5 | 362 | 400 | 8 | 2 | 6 | 105- | 65 | 1 | 6 | 6 | 79 | 24 | 6 | 0 | 7 | 131 | 133 |
| 1 | 9 | 4 | 159 | -193 | 5 | 2 | 5 | 71- | 32 | 5 | 5 | 5 | 168 | -142 | 4 | 9 | 5 | 345 | -363 | 9 | 2 | 6 | 339 | -349 | 1 | 6 | 6 | 319 | -315 | 6 | 0 | 7 | 128 | -129 |
| 2 | 9 | 4 | 174 | 185 | 5 | 2 | 5 | 88- | 14 | 6 | 5 | 5 | 171 | -180 | 4 | 9 | 5 | 79 | 90 | 10 | 2 | 6 | 228 | -230 | 1 | 6 | 6 | 62 | 46 | 7 | 0 | 7 | 179 | -189 |
| 2 | 9 | 4 | 88- | 127 | 6 | 2 | 5 | 79 | 60 | 6 | 5 | 5 | 94 | -89 | 5 | 9 | 5 | 68 | -85 | 0 | 3 | 6 | 437 | 405 | 1 | 6 | 6 | 128 | -80 | 8 | 0 | 7 | 228 | 220 |
| 2 | 9 | 4 | 211 | 257 | 6 | 2 | 5 | 99 | 51 | 6 | 5 | 5 | 54- | -17 | 6 | 9 | 5 | 25- | -50 | 0 | 3 | 6 | 806 | -815 | 2 | 6 | 6 | 337 | 284 | 9 | 0 | 7 | 59- | 45 |
| 3 | 9 | 4 | 71- | -3 | 6 | 2 | 5 | 111 | 110 | 6 | 5 | 5 | 131 | 108 | 7 | 9 | 5 | 45 | 70 | 1 | 3 | 6 | 174 | -124 | 2 | 6 | 6 | 422 | -433 | 10 | 0 | 7 | 105 | -91 |
| 3 | 9 | 4 | 79- | 110 | 6 | 2 | 5 | 418 | -433 | 7 | 5 | 5 | 91 | -87 | 0 | 10 | 5 | 42- | -16 | 1 | 3 | 6 | 119 | -87 | 2 | 6 | 6 | 305 | -333 | 0 | 1 | 7 | 743 | 738 |
| 3 | 9 | 4 | 134 | 138 | 7 | 2 | 5 | 228 | -233 | 7 | 5 | 5 | 228 | -295 | 0 | 10 | 5 | 62 | -81 | 1 | 3 | 6 | 277 | 248 | 2 | 6 | 6 | 325 | 327 | 0 | 1 | 7 | 153 | 127 |
| 4 | 9 | 4 | 322 | -320 | 7 | 2 | 5 | 442 | 392 | 7 | 5 | 5 | 225 | -224 | 1 | 10 | 5 | 42- | 44 | 1 | 3 | 6 | 277 | 244 | 3 | 6 | 6 | 388 | 377 | 1 | 1 | 7 | 105 | 53 |
| 4 | 9 | 4 | 154 | -164 | 7 | 2 | 5 | 234 | 265 | 8 | 5 | 5 | 137 | -121 | 1 | 10 | 5 | 148 | -160 | 2 | 3 | 6 | 542 | -502 | 3 | 6 | 6 | 108 | 50 | 1 | 1 | 7 | 471 | 466 |
| 5 | 9 | 4 | 179 | -206 | 7 | 2 | 5 | 222 | -240 | 9 | 5 | 5 | 151 | -111 | 2 | 10 | 5 | 51- | 74 | 2 | 3 | 6 | 537 | 515 | 3 | 6 | 6 | 665 | -681 | 1 | 1 | 7 | 71- | -12 |
| 5 | 9 | 4 | 65 | -104 | 8 | 2 | 5 | 142 | -157 | 0 | 6 | 5 | 431 | -391 | 2 | 10 | 5 | 139 | -159 | 2 | 3 | 6 | 545 | 554 | 3 | 6 | 6 | 142 | -121 | 1 | 1 | 7 | 342 | 301 |
| 6 | 9 | 4 | 28- | 11 | 8 | 2 | 5 | 111- | 39 | 0 | 6 | 5 | 234 | 218 | 3 | 10 | 5 | 28- | -5 | 2 | 3 | 6 | 82- | -18 | 4 | 6 | 6 | 125 | -115 | 2 | 1 | 7 | 182 | -148 |
| 7 | 9 | 4 | 254 | 273 | 9 | 2 | 5 | 408 | -419 | 1 | 6 | 5 | 268 | -220 | 3 | 10 | 5 | 248 | 292 | 3 | 3 | 6 | 108 | -92 | 4 | 6 | 6 | 408 | 400 | 2 | 1 | 7 | 82- | 58 |
| 0 | 10 | 4 | 57- | -42 | 10 | 2 | 5 | 105 | 129 | 1 | 6 | 5 | 62- | 10 | 4 | 10 | 5 | 174 | 211 | 3 | 3 | 6 | 251 | 223 | 4 | 6 | 6 | 117 | 110 | 2 | 1 | 7 | 291 | -323 |
| 0 | 10 | 4 | 437 | -392 | 0 | 3 | 5 | 182 | 149 | 1 | 6 | 5 | 125 | 82 | 5 | 10 | 5 | 37- | 35 | 3 | 3 | 6 | 222 | 213 | 4 | 6 | 6 | 445 | -447 | 2 | 1 | 7 | 385 | -363 |
| 1 | 10 | 4 | 34- | 27 | 0 | 3 | 5 | 114 | -122 | 1 | 6 | 5 | 194 | 181 | 6 | 10 | 5 | 8- | -55 | 3 | 3 | 6 | 574 | -580 | 5 | 6 | 6 | 154 | 164 | 3 | 1 | 7 | 91- | 34 |
| 1 | 10 | 4 | 51- | -70 | 1 | 3 | 5 | 114 | 92 | 2 | 6 | 5 | 97 | -64 | 0 | 0 | 6 | 122 | 102 | 4 | 3 | 6 | 219 | 201 | 5 | 6 | 6 | 128 | 124 | 3 | 1 | 7 | 337 | -306 |
| 1 | 10 | 4 | 51- | -15 | 1 | 3 | 5 | 525 | -478 | 2 | 6 | 5 | 448 | -461 | 1 | 0 | 6 | 695 | 711 | 4 | 3 | 6 | 125 | 101 | 5 | 6 | 6 | 322 | -311 | 3 | 1 | 7 | 445 | 438 |
| 1 | 10 | 4 | 125 | -157 | 1 | 3 | 5 | 799 | 842 | 2 | 6 | 5 | 563 | -580 | 1 | 0 | 6 | 168 | -160 | 4 | 3 | 6 | 177 | -179 | 6 | 6 | 6 | 168 | -197 | 3 | 1 | 7 | 105 | -85 |
| 2 | 10 | 4 | 57- | 82 | 1 | 3 | 5 | 231 | -214 | 2 | 6 | 5 | 319 | 303 | 2 | 0 | 6 | 88- | 18 | 4 | 3 | 6 | 134 | -117 | 6 | 6 | 6 | 68 | 102 | 4 | 1 | 7 | 348 | 326 |
| 2 | 10 | 4 | 65- | 111 | 2 | 3 | 5 | 608 | -553 | 3 | 6 | 5 | 405 | 387 | 2 | 0 | 6 | 85 | -92 | 5 | 3 | 6 | 102 | -134 | 6 | 6 | 6 | 231 | 216 | 4 | 1 | 7 | 85 | -101 |
| 2 | 10 | 4 | 102 | 77 | 2 | 3 | 5 | 462 | 434 | 3 | 6 | 5 | 279 | -258 | 3 | 0 | 6 | 611 | -618 | 5 | 3 | 6 | 99 | -79 | 7 | 6 | 6 | 197 | -171 | 4 | 1 | 7 | 508 | 524 |
| 3 | 10 | 4 | 194 | 184 | 2 | 3 | 5 | 208 | 216 | 3 | 6 | 5 | 71- | -43 | 3 | 0 | 6 | 537 | 550 | 5 | 3 | 6 | 491 | -518 | 7 | 6 | 6 | 191 | 194 | 4 | 1 | 7 | 182 | 185 |
| 3 | 10 | 4 | 202 | 235 | 2 | 3 | 5 | 439 | -461 | 3 | 6 | 5 | 211 | -204 | 4 | 0 | 6 | 62- | -45 | 5 | 3 | 6 | 494 | 506 | 8 | 6 | 6 | 277 | -228 | 5 | 1 | 7 | 106 | 100 |
| 4 | 10 | 4 | 17- | -41 | 3 | 3 | 5 | 88- | 25 | 4 | 6 | 5 | 299 | 261 | 4 | 0 | 6 | 508 | 546 | 6 | 3 | 6 | 354 | -380 | 8 | 6 | 6 | 57- | -34 | 5 | 1 | 7 | 408 | 409 |
| 4 | 10 | 4 | 34- | -15 | 3 | 3 | 5 | 251 | 264 | 4 | 6 | 5 | 179 | 160 | 5 | 0 | 6 | 157 | 153 | 6 | 3 | 6 | 239 | 236 | 0 | 7 | 6 | 159 | -162 | 5 | 1 | 7 | 237 | -231 |
| 5 | 10 | 4 | 139 | -167 | 3 | 3 | 5 | 439 | -414 | 4 | 6 | 5 | 142 | 142 | 5 | 0 | 6 | 71- | 35 | 6 | 3 | 6 | 268 | 270 | 0 | 7 | 6 | 302 | 282 | 5 | 1 | 7 | 394 | 436 |
| 6 | 10 | 4 | 74 | -104 | 3 | 3 | 5 | 637 | -673 | 4 | 6 | 5 | 134 | -114 | 6 | 0 | 6 | 162 | 148 | 6 | 3 | 6 | 57- | 42 | 1 | 7 | 6 | 188 | 171 | 6 | 1 | 7 | 237 | -242 |
| 0 | 0 | 5 | 159 | -61 | 4 | 3 | 5 | 485 | 465 | 5 | 6 | 5 | 257 | -246 | 6 | 0 | 6 | 538 | -560 | 7 | 3 | 6 | 339 | 367 | 1 | 7 | 6 | 74- | -2 | 6 | 1 | 7 | 302 | 308 |
| 1 | 0 | 5 | 436 | 480 | 4 | 3 | 5 | 291 | 268 | 5 | 6 | 5 | 268 | 251 | 7 | 0 | 6 | 31- | -5 | 7 | 3 | 6 | 111 | 125 | 1 | 7 | 6 | 74- | -46 | 6 | 1 | 7 | 319 | -340 |
| 1 | 0 | 5 | 677 | -735 | 4 | 3 | 5 | 462 | -460 | 5 | 6 | 5 | 62- | 15 | 7 | 0 | 6 | 100 | -45 | 7 | 3 | 6 | 105 | -90 | 1 | 7 | 6 | 83- | -31 | 6 | 1 | 7 | 108 | 109 |
| 2 | 0 | 5 | 531 | 513 | 4 | 3 | 5 | 474 | 470 | 5 | 6 | 5 | 79- | 61 | 8 | 0 | 6 | 282 | 282 | 8 | 3 | 6 | 268 | -269 | 2 | 7 | 6 | 368 | 343 | 7 | 1 | 7 | 348 | -353 |
| 2 | 0 | 5 | 199 | 190 | 5 | 3 | 5 | 337 | 301 | 6 | 6 | 5 | 79 | 52 | 9 | 0 | 6 | 88 | 65 | 8 | 3 | 6 | 71- | -81 | 2 | 7 | 6 | 562 | -568 | 7 | 1 | 7 | 308 | -345 |
| 3 | 0 | 5 | 354 | -330 | 5 | 3 | 5 | 428 | -424 | 6 | 6 | 5 | 202 | -211 | 10 | 0 | 6 | 77 | -72 | 9 | 3 | 6 | 434 | -399 | 2 | 7 | 6 | 194 | -180 | 8 | 1 | 7 | 174 | 157 |
| 3 | 0 | 5 | 399 | 435 | 5 | 3 | 5 | 65- | -37 | 6 | 6 | 5 | 299 | 289 | 11 | 0 | 6 | 162 | -167 | 10 | 3 | 6 | 34- | -30 | 2 | 7 | 6 | 268 | 254 | 9 | 1 | 7 | 51- | 47 |
| 4 | 0 | 5 | 385 | -359 | 5 | 3 | 5 | 422 | 418 | 7 | 6 | 5 | 85 | -163 | 0 | 1 | 6 | 552 | 548 | 0 | 4 | 6 | 91 | -50 | 3 | 7 | 6 | 57- | 55 | 10 | 1 | 7 | 185 | -164 |
| 4 | 0 | 5 | 322 | 302 | 6 | 3 | 5 | 151 | -138 | 7 | 6 | 5 | 408 | -366 | 0 | 1 | 6 | 252 | 287 | 0 | 4 | 6 | 157 | -136 | 3 | 7 | 6 | 131 | -137 | 0 | 2 | 7 | 371 | 329 |
| 5 | 0 | 5 | 99 | 36 | 6 | 3 | 5 | 202 | -189 | 7 | 6 | 5 | 74- | -35 | 1 | 1 | 6 | 85- | -6 | 1 | 4 | 6 | 874 | -804 | 3 | 7 | 6 | 97 | -57 | 0 | 2 | 7 | 257 | 219 |
| 5 | 0 | 5 | 325 | -329 | 6 | 3 | 5 | 191 | 210 | 8 | 6 | 5 | 62 | -40 | 1 | 1 | 6 | 479 | 482 | 1 | 4 | 6 | 205 | -157 | 3 | 7 | 6 | 348 | 358 | 1 | 2 | 7 | 265 | -224 |
| 6 | 0 | 5 | 117 | 106 | 6 | 3 | 5 | 168 | -173 | 0 | 7 | 5 | 185 | -179 | 1 | 1 | 6 | 179 | -165 | 1 | 4 | 6 | 639 | 633 | 4 | 7 | 6 | 45- | 2 | 1 | 2 | 7 | 505 | 511 |
| 6 | 0 | 5 | 194 | -203 | 7 | 3 | 5 | 145 | -161 | 0 | 7 | 5 | 337 | 327 | 1 | 1 | 6 | 462 | -406 | 1 | 4 | 6 | 328 | 285 | 4 | 7 | 6 | 205 | 187 | 1 | 2 | 7 | 271 | -253 |
| 7 | 0 | 5 | 85 | 61 | 7 | 3 | 5 | 397 | 364 | 1 | 7 | 5 | 20- | -13 | 2 | 1 | 6 | 448 | -373 | 2 | 4 | 6 | 428 | -374 | 4 | 7 | 6 | 134 | -109 | 1 | 2 | 7 | 888 | 866 |
| 7 | 0 | 5 | 705 | 798 | 7 | 3 | 5 | 134 | 116 | 1 | 7 | 5 | 462 | 444 | 2 | 1 | 6 | 722 | 721 | 2 | 4 | 6 | 225 | 212 | 5 | 7 | 6 | 111 | 137 | 2 | 2 | 7 | 234 | -214 |
| 8 | 0 | 5 | 385 | 384 | 7 | 3 | 5 | 174 | -160 | 1 | 7 | 5 | 251 | -237 | 2 | 1 | 6 | 122 | -127 | 2 | 4 | 6 | 425 | 445 | 5 | 7 | 6 | 191 | 196 | 2 | 2 | 7 | 337 | 319 |
| 9 | 0 | 5 | 62- | 1 | 8 | 3 | 5 | 348 | -343 | 1 | 7 | 5 | 274 | 267 | 2 | 1 | 6 | 439 | -442 | 2 | 4 | 6 | 145 | 136 | 5 | 7 | 6 | 477 | -479 | 2 | 2 | 7 | 85- | -15 |
| 10 | 0 | 5 | 97 | -105 | 8 | 3 | 5 | 23- | -11 | 2 | 7 | 5 | 394 | 365 | 3 | 1 | 6 | 528 | -487 | 3 | 4 | 6 | 131 | 120 | 6 | 7 | 6 | 82 | -116 | 2 | 2 | 7 | 222 | -207 |
| 11 | 0 | 5 | 31- | -52 | 9 | 3 | 5 | 148 | -142 | 2 | 7 | 5 | 234 | -206 | 3 | 1 | 6 | 394 | -384 | 3 | 4 | 6 | 411 | 378 | 6 | 7 | 6 | 101 | -48 | 3 | 2 | 7 | 154 | -135 |
| 0 | 1 | 5 | 331 | 333 | 10 | 3 | 5 | 245 | 239 | 2 | 7 | 5 | 311 | -319 | 3 | 1 | 6 | 752 | 761 | 3 | 4 | 6 | 208 | -102 | 7 | 7 | 6 | 291 | -253 | 3 | 2 | 7 | 85- | -33 |
| 0 | 1 | 5 | 400 | -301 | 0 | 4 | 5 | 572 | 555 | 2 | 7 | 5 | 197 | 181 | 3 | 1 | 6 | 345 | 326 | 3 | 4 | 6 | 379 | -352 | 7 | 7 | 6 | 74- | 75 | 3 | 2 | 7 | 351 | 354 |
| 1 | 1 | 5 | 408 | 345 | 0 | 4 | 5 | 382 | 339 | 3 | 7 | 5 | 434 | 396 | 4 | 1 | 6 | 94 | 100 | 4 | 4 | 6 | 71 | 55 | 8 | 7 | 6 | 34- | -38 | 3 | 2 | 7 | 342 | -323 |
| 1 | 1 | 5 | 62- | -6 | 1 | 4 | 5 | 174 | 103 | 3 | 7 | 5 | 79- | -56 | 4 | 1 | 6 | 351 | -313 | 4 | 4 | 6 | 54 | -35 | 8 | 7 | 6 | 68- | -25 | 4 | 2 | 7 | 277 | 273 |
| 1 | 1 | 5 | 285 | -295 | 1 | 4 | 5 | 217 | -190 | 3 | 7 | 5 | 165 | -136 | 4 | 1 | 6 | 99 | 83 | 4 | 4 | 6 | 491 | -498 | 0 | 8 | 6 | 102 | -124 | 4 | 2 | 7 | 251 | -235 |
| 1 | 1 | 5 | 902 | -895 | 1 | 4 | 5 | 562 | 549 | 3 | 7 | 5 | 139 | 157 | 4 | 1 | 6 | 325 | 341 | 4 | 4 | 6 | 291 | -304 | 0 | 8 | 6 | 243 | 234 | 4 | 2 | 7 | 65- | -3 |
| 2 | 1 | 5 | 514 | -407 | 1 | 4 | 5 | 374 | 326 | 4 | 7 | 5 | 74 | -52 | 5 | 1 | 6 | 354 | 328 | 5 | 4 | 6 | 62 | -50 | 1 | 8 | 6 | 322 | 314 | 4 | 2 | 7 | 82- | -32 |
| 2 | 1 | 5 | 905 | 958 | 2 | 4 | 5 | 471 | -437 | 4 | 7 | 5 | 57- | 7 | 5 | 1 | 6 | 65 | 36 | 5 | 4 | 6 | 325 | -342 | 1 | 8 | 6 | 262 | 242 | 5 | 2 | 7 | 97 | -91 |
| 2 | 1 | 5 | 345 | 341 | 2 | 4 | 5 | 77- | -28 | 4 | 7 | 5 | 88 | 39 | 5 | 1 | 6 | 542 | -547 | 5 | 4 | 6 | 205 | -207 | 1 | 8 | 6 | 205 | -165 | 5 | 2 | 7 | 108 | 114 |
| 2 | 1 | 5 | 265 | -247 | 2 | 4 | 5 | 171 | -163 | 4 | 7 | 5 | 271 | -277 | 5 | 1 | 6 | 525 | 552 | 5 | 4 | 6 | 85 | 51 | 1 | 8 | 6 | 151 | -178 | 5 | 2 | 7 | 539 | -541 |
| 3 | 1 | 5 | 601 | -537 | 2 | 4 | 5 | 177 | -175 | 5 | 7 | 5 | 191 | 194 | 6 | 1 | 6 | 137 | 138 | 6 | 4 | 6 | 179 | -247 | 2 | 8 | 6 | 114 | 122 | 5 | 2 | 7 | 374 | 374 |
| 3 | 1 | 5 | 279 | 243 | 3 | 4 | 5 | 345 | 296 | 5 | 7 | 5 | 185 | -153 | 6 | 1 | 6 | 202 | 180 | 6 | 4 | 6 | 134 | 35 | 2 | 8 | 6 | 319 | -294 | 6 | 2 | 7 | 305 | -390 |
| 3 | 1 | 5 | 1017 | 1002 | 3 | 4 | 5 | 797 | 809 | 5 | 7 | 5 | 197 | -187 | 6 | 1 | 6 | 62 | -53 | 6 | 4 | 6 | 322 | 321 | 2 | 8 | 6 | 111 | -7 | 6 | 2 | 7 | 474 | 511 |
| 3 | 1 | 5 | 471 | 456 | 3 | 4 | 5 | 305 | -308 | 6 | 7 | 5 | 177 | 177 | 6 | 1 | 6 | 141 | -164 | 6 | 4 | 6 | 191 | 186 | 2 | 8 | 6 | 114 | 89 | 6 | 2 | 7 | 291 | -304 |
| 4 | 1 | 5 | 657 | -658 | 3 | 4 | 5 | 657 | -682 | 6 | 7 | 5 | 191 | -199 | 7 | 1 | 6 | 279 | -314 | 7 | 4 | 6 | 108 | -80 | 3 | 8 | 6 | 354 | -342 | 6 | 2 | 7 | 74- | 30 |
| 4 | 1 | 5 | 488 | -450 | 4 | 4 | 5 | 257 | 225 | 6 | 7 | 5 | 331 | 354 | 7 | 1 | 6 | 148 | -146 | 7 | 4 | 6 | 208 | -213 | 3 | 8 | 6 | 151 | -97 | 7 | 2 | 7 | 165 | -151 |
| 4 | 1 | 5 | 48- | -14 | 4 | 4 | 5 | 619 | 602 | 7 | 7 | 5 | 239 | -217 | 7 | 1 | 6 | 214 | 217 | 8 | 4 | 6 | 311 | -304 | 3 | 8 | 6 | 258 | 276 | 7 | 2 | 7 | 182 | -197 |
| 4 | 1 | 5 | 339 | 366 | 4 | 4 | 5 | 439 | -453 | 7 | 7 | 5 | 194 | 165 | 7 | 1 | 6 | 257 | -304 | 8 | 4 | 6 | 414 | -403 | 4 | 8 | 6 | 97 | -97 | 8 | 2 | 7 | 259 | 275 |
| 5 | 1 | 5 | 21- | 15 | 4 | 4 | 5 | 88 | -76 | 8 | 7 | 5 | 265 | 244 | 8 | 1 | 6 | 374 | 390 | 9 | 4 | 6 | 77 | -59 | 4 | 8 | 6 | 202 | 276 | 8 | 2 | 7 | 168 | -160 |
| 5 | 1 | 5 | 139 | -86 | 5 | 4 | 5 | 59- | 0 | 8 | 7 | 5 | 74- | -32 | 8 | 1 | 6 | 91- | 172 | 9 | 4 | 6 | 48- | 29 | 4 | 8 | 6 | 208 | 216 | 9 | 2 | 7 | 59- | -29 |
| 5 | 1 | 5 | 157 | -171 | 5 | 4 | 5 | 145 | -142 | 0 | 8 | 5 | 197 | -197 | 9 | 1 | 6 | 68 | 52 | 0 | 5 | 6 | 565 | -533 | 5 | 8 | 6 | 111 | 53 | 9 | 2 | 7 | 85- | 144 |
| 5 | 1 | 5 | 285 | -260 | 5 | 4 | 5 | 368 | 377 | 0 | 8 | 5 | 148 | -127 | 10 | 1 | 6 | 217 | -196 | 0 | 5 | 6 | 331 | -278 | 5 | 8 | 6 | 225 | -223 | 10 | 2 | 7 | 334 | -311 |
| 6 | 1 | 5 | 139 | 113 | 5 | 4 | 5 | 185 | 178 | 1 | 8 | 5 | 237 | 224 | 0 | 2 | 6 | 422 | 365 | 1 | 5 | 6 | 465 | -414 | 6 | 8 | 6 | 168 | -148 | 0 | 3 | 7 | 142 | -108 |
| 6 | 1 | 5 | 205 | 191 | 6 | 4 | 5 | 142 | -134 | 1 | 8 | 5 | 277 | 262 | 0 | 2 | 6 | 615 | -651 | 1 | 5 | 6 | 174 | -156 | 6 | 8 | 6 | 122 | -126 | 0 | 3 | 7 | 597 | -595 |
| 6 | 1 | 5 | 317 | 331 | 6 | 4 | 5 | 157 | -218 | 1 | 8 | 5 | 351 | -340 | 1 | 2 | 6 | 94- | -43 | 1 | 5 | 6 | 274 | 299 | 7 | 8 | 6 | 34- | 37 | 1 | 3 | 7 | 797 | -767 |
| 6 | 1 | 5 | 652 | -693 | 6 | 4 | 5 | 239 | 228 | 1 | 8 | 5 | 114 | 112 | 1 | 2 | 6 | 462 | 452 | 1 | 5 | 6 | 82- | 21 | 7 | 8 | 6 | 65- | 30 | 1 | 3 | 7 | 402 | 386 |
| 7 | 1 | 5 | 151 | -140 | 6 | 4 | 5 | 91 | 104 | 2 | 8 | 5 | 471 | 426 | 1 | 2 | 6 | 468 | -464 | 2 | 5 | 6 | 171 | 119 | 8 | 8 | 6 | 54- | 85 | 1 | 3 | 7 | 411 | -397 |
| 7 | 1 | 5 | 142 | 110 | 7 | 4 | 5 | 42- | -55 | 2 | 8 | 5 | 119 | 15 | 1 | 2 | 6 | 119 | 110 | 2 | 5 | 6 | 357 | -326 | 0 | 9 | 6 | 57 | 71 | 1 | 3 | 7 | 314 | 274 |
| 7 | 1 | 5 | 621 | 622 | 7 | 4 | 5 | 239 | -237 | 2 | 8 | 5 | 242 | -217 | 2 | 2 | 6 | 162 | -146 | 2 | 5 | 6 | 88- | 42 | 0 | 9 | 6 | 91 | 83 | 2 | 3 | 7 | 365 | -295 |
| 7 | 1 | 5 | 77- | 10 | 7 | 4 | 5 | 379 | -389 | 2 | 8 | 5 | 265 | 248 | 2 | 2 | 6 | 517 | 487 | 2 | 5 | 6 | 142 | 129 | 1 | 9 | 6 | 199 | 180 | 2 | 3 | 7 | 394 | 382 |
| 8 | 1 | 5 | 65- | 32 | 8 | 4 | 5 | 77 | -91 | 3 | 8 | 5 | 59- | -15 | 2 | 2 | 6 | 117 | 112 | 3 | 5 | 6 | 391 | 346 | 1 | 9 | 6 | 162 | -196 | 2 | 3 | 7 | 139 | -105 |
| 9 | 1 | 5 | 174 | -180 | 9 | 4 | 5 | 94 | -84 | 3 | 8 | 5 | 202 | -201 | 2 | 2 | 6 | 465 | -173 | 3 | 5 | 6 | 425 | 418 | 2 | 9 | 6 | 145 | 136 | 2 | 3 | 7 | 357 | 336 |
| 10 | 1 | 5 | 128 | -140 | 0 | 5 | 5 | 114 | -68 | 3 | 8 | 5 | 82- | 57 | 3 | 2 | 6 | 374 | -297 | 3 | 5 | 6 | 675 | -685 | 2 | 9 | 6 | 174 | -185 | 3 | 3 | 7 | 199 | 160 |
| 0 | 2 | 5 | 365 | 342 | 0 | 5 | 5 | 282 | 228 | 3 | 8 | 5 | 234 | 261 | 3 | 2 | 6 | 205 | 139 | 3 | 5 | 6 | 448 | -437 | 3 | 9 | 6 | 88 | -135 | 3 | 3 | 7 | 185 | 145 |
| 0 | 2 | 5 | 482 | -453 | 1 | 5 | 5 | 391 | -324 | 4 | 8 | 5 | 154 | -152 | 3 | 2 | 6 | 579 | 612 | 4 | 5 | 6 | 94 | 73 | 3 | 9 | 6 | 197 | 226 | 3 | 3 | 7 | 79- | 53 |
| 1 | 2 | 5 | 91- | -49 | 1 | 5 | 5 | 122 | -125 | 4 | 8 | 5 | 302 | 287 | 3 | 2 | 6 | 342 | -342 | 4 | 5 | 6 | 302 | 291 | 4 | 9 | 6 | 171 | 192 | 3 | 3 | 7 | 234 | -215 |
| 1 | 2 | 5 | 459 | -428 | 1 | 5 | 5 | 317 | 312 | 4 | 8 | 5 | 74 | -88 | 4 | 2 | 6 | 339 | 316 | 4 | 5 | 6 | 331 | -317 | 5 | 9 | 6 | 51- | 8 | 4 | 3 | 7 | 231 | 222 |
| 1 | 2 | 5 | 262 | 255 | 1 | 5 | 5 | 674 | 684 | 5 | 8 | 5 | 82 | 104 | 4 | 2 | 6 | 168 | -151 | 4 | 5 | 6 | 291 | -296 | 6 | 9 | 6 | 82 | -86 | 4 | 3 | 7 | 274 | -265 |
| 1 | 2 | 5 | 561 | -544 | 2 | 5 | 5 | 294 | -244 | 5 | 8 | 5 | 119 | -79 | 4 | 2 | 6 | 259 | -258 | 5 | 5 | 6 | 45 | -93 | 7 | 9 | 6 | 31- | -28 | 4 | 3 | 7 | 125 | -111 |
| 2 | 2 | 5 | 694 | -618 | 2 | 5 | 5 | 574 | -579 | 5 | 8 | 5 | 262 | -303 | 4 | 2 | 6 | 368 | 362 | 5 | 5 | 6 | 305 | -267 | 0 | 10 | 6 | 48- | -18 | 4 | 3 | 7 | 251 | -260 |
| 2 | 2 | 5 | 179 | 179 | 2 | 5 | 5 | 174 | -160 | 6 | 8 | 5 | 111 | -108 | 5 | 2 | 6 | 277 | 243 | 5 | 5 | 6 | 119 | 97 | 2 | 10 | 6 | 135 | 147 | 5 | 3 | 7 | 322 | -321 |
| 2 | 2 | 5 | 1101 | 1185 | 2 | 5 | 5 | 91- | 55 | 6 | 8 | 5 | 62- | -12 | 5 | 2 | 6 | 185 | -178 | 5 | 5 | 6 | 91 | -89 | 0 | 0 | 7 | 265 | 256 | 5 | 3 | 7 | 91 | -86 |
| 2 | 2 | 5 | 748 | -743 | 3 | 5 | 5 | 219 | 193 | 7 | 8 | 5 | 108 | 105 | 5 | 2 | 6 | 245 | -257 | 6 | 5 | 6 | 219 | -225 | 1 | 0 | 7 | 420 | 412 | 5 | 3 | 7 | 442 | -448 |
| 3 | 2 | 5 | 559 | -530 | 3 | 5 | 5 | 85- | -75 | 7 | 8 | 5 | 182 | 196 | 5 | 2 | 6 | 417 | 452 | 6 | 5 | 6 | 222 | 212 | 1 | 0 | 7 | 74- | -17 | 5 | 3 | 7 | 494 | 512 |
| 3 | 2 | 5 | 282 | 271 | 3 | 5 | 5 | 388 | -420 | 8 | 8 | 5 | 65- | 72 | 6 | 2 | 6 | 494 | -499 | 6 | 5 | 6 | 254 | 239 | 2 | 0 | 7 | 255 | -246 | 6 | 3 | 7 | 168 | 202 |
| 3 | 2 | 5 | 386 | 403 | 3 | 5 | 5 | 471 | -454 | 0 | 9 | 5 | 68- | -71 | 6 | 2 | 6 | 429 | 426 | 7 | 5 | 6 | 142 | -121 | 2 | 0 | 7 | 448 | -470 | 6 | 3 | 7 | 119 | -98 |

**Table III.** (Continued)

| h | k | l | $10F_o$ | $10F_c$ | h | k | l | $10F_o$ | $10F_c$ | h | k | l | $10F_o$ | $10F_c$ | h | k | l | $10F_o$ | $10F_c$ | h | k | l | $10F_o$ | $10F_c$ | h | k | l | $10F_o$ | $10F_c$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6 | 3 | 7 | 279 | 294 | 2 | 7 | 7 | 151 | -126 | 3 | 2 | 8 | 157 | -160 | 0 | 6 | 8 | 82 | -66 | 0 | 2 | 9 | 291 | 280 | 0 | 6 | 9 | 228 | 229 | 0 | 3 | 10 | 408 | 430 |
| 7 | 3 | 7 | 271 | 285 | 2 | 7 | 7 | 174 | -142 | 3 | 2 | 8 | 368 | 362 | 0 | 6 | 8 | 234 | -220 | 1 | 2 | 9 | 162 | 149 | 0 | 6 | 9 | 288 | -261 | 1 | 3 | 10 | 174 | 134 |
| 7 | 3 | 7 | 77 | -38 | 3 | 7 | 7 | 94 | 92 | 3 | 2 | 8 | 137 | -128 | 1 | 6 | 8 | 125 | 83 | 1 | 2 | 9 | 68- | -70 | 1 | 6 | 9 | 94 | 77 | 1 | 3 | 10 | 151 | 144 |
| 8 | 3 | 7 | 139 | 131 | 3 | 7 | 7 | 239 | -269 | 4 | 2 | 8 | 448 | 431 | 1 | 6 | 8 | 297 | -272 | 1 | 2 | 9 | 291 | -306 | 1 | 6 | 9 | 108 | -57 | 1 | 3 | 10 | 91 | 91 |
| 8 | 3 | 7 | 168 | -141 | 3 | 7 | 7 | 197 | 179 | 4 | 2 | 8 | 171 | -160 | 1 | 6 | 8 | 274 | 202 | 1 | 2 | 9 | 111 | 100 | 1 | 6 | 9 | 74 | -61 | 1 | 3 | 10 | 297 | -286 |
| 9 | 3 | 7 | 219 | -188 | 4 | 7 | 7 | 99 | 111 | 4 | 2 | 8 | 437 | 431 | 1 | 6 | 8 | 528 | -514 | 2 | 2 | 9 | 291 | 288 | 2 | 6 | 9 | 311 | 339 | 2 | 3 | 10 | 271 | 304 |
| 9 | 3 | 7 | 57- | -110 | 4 | 7 | 7 | 57- | -13 | 4 | 2 | 8 | 85 | -70 | 2 | 6 | 8 | 42- | -4 | 2 | 2 | 9 | 322 | -339 | 2 | 6 | 9 | 257 | 245 | 2 | 3 | 10 | 237 | -241 |
| 10 | 3 | 7 | 239 | -213 | 4 | 7 | 7 | 179 | 184 | 5 | 2 | 8 | 454 | 461 | 2 | 6 | 8 | 91 | 100 | 2 | 2 | 9 | 599 | -639 | 2 | 6 | 9 | 282 | -262 | 2 | 3 | 10 | 305 | -337 |
| 0 | 4 | 7 | 368 | -322 | 5 | 7 | 7 | 379 | 363 | 5 | 2 | 8 | 79- | -41 | 2 | 6 | 8 | 331 | 352 | 2 | 2 | 9 | 491 | 487 | 3 | 6 | 9 | 177 | 172 | 2 | 3 | 10 | 119 | 101 |
| 0 | 4 | 7 | 642 | -653 | 5 | 7 | 7 | 214 | -234 | 5 | 2 | 8 | 274 | 262 | 2 | 6 | 8 | 299 | -292 | 3 | 2 | 9 | 357 | 342 | 3 | 6 | 9 | 114 | 99 | 3 | 3 | 10 | 142 | -142 |
| 1 | 4 | 7 | 674 | -595 | 6 | 7 | 7 | 277 | 216 | 6 | 2 | 8 | 168 | -194 | 3 | 6 | 8 | 42- | 4 | 3 | 2 | 9 | 182 | -193 | 4 | 6 | 9 | 114 | -103 | 3 | 3 | 10 | 445 | 412 |
| 1 | 4 | 7 | 571 | -493 | 6 | 7 | 7 | 251 | -232 | 6 | 2 | 8 | 322 | 361 | 3 | 6 | 8 | 159 | 122 | 3 | 2 | 9 | 302 | -296 | 4 | 6 | 9 | 165 | 160 | 4 | 3 | 10 | 102 | 110 |
| 1 | 4 | 7 | 254 | -234 | 7 | 7 | 7 | 68 | -48 | 7 | 2 | 8 | 257 | -255 | 3 | 6 | 8 | 251 | 243 | 3 | 2 | 9 | 188 | -196 | 5 | 6 | 9 | 65 | -8 | 4 | 3 | 10 | 222 | 194 |
| 1 | 4 | 7 | 111 | 117 | 7 | 7 | 7 | 68- | 65 | 7 | 2 | 8 | 101 | -20 | 4 | 6 | 8 | 105 | -136 | 4 | 2 | 9 | 31- | 51 | 5 | 6 | 9 | 54- | 0 | 5 | 3 | 10 | 323 | 313 |
| 2 | 4 | 7 | 337 | 301 | 8 | 7 | 7 | 57- | 30 | 8 | 2 | 8 | 139 | 132 | 4 | 6 | 8 | 99 | 60 | 4 | 2 | 9 | 97 | 92 | 6 | 6 | 9 | 74 | 101 | 5 | 3 | 10 | 191 | -203 |
| 2 | 4 | 7 | 228 | 207 | 0 | 8 | 7 | 137 | 110 | 8 | 2 | 8 | 285 | -337 | 5 | 6 | 8 | 85 | 67 | 4 | 2 | 9 | 319 | -273 | 6 | 6 | 9 | 165 | -115 | 6 | 3 | 10 | 68 | -70 |
| 2 | 4 | 7 | 165 | 176 | 0 | 8 | 7 | 185 | 165 | 9 | 2 | 8 | 65 | 68 | 5 | 6 | 8 | 91 | -35 | 5 | 2 | 9 | 242 | 256 | 7 | 6 | 9 | 279 | 250 | 6 | 3 | 10 | 48 | -65 |
| 2 | 4 | 7 | 128 | 120 | 1 | 8 | 7 | 317 | 309 | 10 | 2 | 8 | 202 | -192 | 6 | 6 | 8 | 108 | 130 | 5 | 2 | 9 | 265 | -251 | 7 | 6 | 9 | 48- | -53 | 7 | 3 | 10 | 159 | -138 |
| 3 | 4 | 7 | 339 | 321 | 1 | 8 | 7 | 139 | -93 | 0 | 3 | 8 | 334 | -314 | 6 | 6 | 8 | 194 | -169 | 6 | 2 | 9 | 139 | -139 | 0 | 7 | 9 | 185 | -170 | 7 | 3 | 10 | 65 | 53 |
| 3 | 4 | 7 | 174 | 152 | 1 | 8 | 7 | 65- | 29 | 0 | 3 | 8 | 82- | 15 | 7 | 6 | 8 | 299 | 242 | 6 | 2 | 9 | 219 | 232 | 1 | 7 | 9 | 168 | -164 | 8 | 3 | 10 | 257 | 209 |
| 3 | 4 | 7 | 77 | 57 | 1 | 8 | 7 | 277 | -288 | 1 | 3 | 8 | 171 | -117 | 7 | 6 | 8 | 137 | 116 | 7 | 2 | 9 | 131 | -82 | 1 | 7 | 9 | 305 | 253 | 8 | 3 | 10 | 42- | 64 |
| 3 | 4 | 7 | 82- | 13 | 2 | 8 | 7 | 322 | -345 | 1 | 3 | 8 | 388 | 346 | 8 | 6 | 8 | 265 | 218 | 7 | 2 | 9 | 179 | 200 | 1 | 7 | 9 | 74 | 66 | 0 | 4 | 10 | 48- | 31 |
| 4 | 4 | 7 | 228 | -200 | 2 | 8 | 7 | 77- | -80 | 1 | 3 | 8 | 482 | -504 | 9 | 6 | 8 | 25- | -1 | 8 | 2 | 9 | 114 | 96 | 2 | 7 | 9 | 242 | 226 | 0 | 4 | 10 | 97 | 85 |
| 4 | 4 | 7 | 343 | -349 | 2 | 8 | 7 | 194 | -196 | 1 | 3 | 8 | 74- | 39 | 0 | 7 | 8 | 59- | 77 | 8 | 2 | 9 | 117 | -138 | 2 | 7 | 9 | 234 | -208 | 1 | 4 | 10 | 402 | 454 |
| 4 | 4 | 7 | 122 | -132 | 3 | 8 | 7 | 139 | -142 | 2 | 3 | 8 | 294 | 248 | 0 | 7 | 8 | 159 | 125 | 9 | 2 | 9 | 311 | 274 | 3 | 7 | 9 | 205 | 183 | 1 | 4 | 10 | 277 | 263 |
| 4 | 4 | 7 | 365 | -368 | 3 | 8 | 7 | 114 | -91 | 2 | 3 | 8 | 59 | -37 | 1 | 7 | 8 | 88 | 108 | 10 | 2 | 9 | 22- | -27 | 3 | 7 | 9 | 68 | -81 | 1 | 4 | 10 | 77 | -69 |
| 5 | 4 | 7 | 137 | -197 | 3 | 8 | 7 | 117 | -80 | 2 | 3 | 8 | 185 | 139 | 1 | 7 | 8 | 299 | -273 | 0 | 3 | 9 | 119 | -125 | 4 | 7 | 9 | 42- | -51 | 1 | 4 | 10 | 171 | -161 |
| 5 | 4 | 7 | 91 | -77 | 4 | 8 | 7 | 219 | 209 | 2 | 3 | 8 | 282 | 264 | 1 | 7 | 8 | 348 | 350 | 0 | 3 | 9 | 74- | 63 | 4 | 7 | 9 | 171 | 191 | 2 | 4 | 10 | 242 | -258 |
| 5 | 4 | 7 | 525 | -528 | 4 | 8 | 7 | 128 | 147 | 3 | 3 | 8 | 479 | 443 | 1 | 7 | 8 | 277 | -261 | 1 | 3 | 9 | 219 | 213 | 5 | 7 | 9 | 45- | -45 | 2 | 4 | 10 | 188 | -179 |
| 5 | 4 | 7 | 165 | 134 | 5 | 8 | 7 | 354 | 360 | 3 | 3 | 8 | 322 | -324 | 2 | 7 | 8 | 119 | 88 | 1 | 3 | 9 | 197 | 188 | 5 | 7 | 9 | 154 | 134 | 3 | 4 | 10 | 131 | 140 |
| 6 | 4 | 7 | 274 | 266 | 5 | 8 | 7 | 71- | -74 | 3 | 3 | 8 | 134 | 133 | 2 | 7 | 8 | 194 | 165 | 1 | 3 | 9 | 539 | -554 | 6 | 7 | 9 | 177 | 166 | 3 | 4 | 10 | 62- | 47 |
| 6 | 4 | 7 | 454 | 462 | 6 | 8 | 7 | 128 | -123 | 3 | 3 | 8 | 88- | 0 | 2 | 7 | 8 | 331 | -318 | 1 | 3 | 9 | 114 | 98 | 6 | 7 | 9 | 137 | -127 | 4 | 4 | 10 | 491 | 505 |
| 7 | 4 | 7 | 159 | 155 | 6 | 8 | 7 | 257 | -281 | 4 | 3 | 8 | 82 | -69 | 3 | 7 | 8 | 94 | 112 | 2 | 3 | 9 | 291 | 274 | 7 | 7 | 9 | 65 | -153 | 4 | 4 | 10 | 294 | 272 |
| 7 | 4 | 7 | 237 | 244 | 7 | 8 | 7 | 54- | -41 | 4 | 3 | 8 | 308 | -301 | 3 | 7 | 8 | 71- | -2 | 2 | 3 | 9 | 248 | -233 | 0 | 8 | 9 | 122 | -12 | 5 | 4 | 10 | 199 | 195 |
| 8 | 4 | 7 | 162 | -153 | 0 | 9 | 7 | 445 | 336 | 4 | 3 | 8 | 94 | 69 | 3 | 7 | 8 | 77- | -84 | 2 | 3 | 9 | 194 | -203 | 1 | 8 | 9 | 184 | 223 | 5 | 4 | 10 | 162 | -149 |
| 8 | 4 | 7 | 177 | -174 | 1 | 9 | 7 | 125 | 129 | 4 | 3 | 8 | 437 | -452 | 4 | 7 | 8 | 214 | -218 | 2 | 3 | 9 | 345 | 345 | 3 | 8 | 9 | 45- | -51 | 6 | 4 | 10 | 145 | -117 |
| 9 | 4 | 7 | 171 | -154 | 1 | 9 | 7 | 31- | 35 | 5 | 3 | 8 | 31- | 52 | 4 | 7 | 8 | 194 | 161 | 3 | 3 | 9 | 197 | 192 | 4 | 8 | 9 | 202 | -224 | 6 | 4 | 10 | 157 | -139 |
| 9 | 4 | 7 | 45- | -104 | 2 | 9 | 7 | 37- | -13 | 5 | 3 | 8 | 239 | -227 | 5 | 7 | 8 | 74 | 64 | 3 | 3 | 9 | 351 | -331 | 4 | 8 | 9 | 25- | 14 | 7 | 4 | 10 | 42- | 8 |
| 0 | 5 | 7 | 317 | -303 | 2 | 9 | 7 | 140 | -157 | 5 | 3 | 8 | 77- | 17 | 5 | 7 | 8 | 114 | -51 | 3 | 3 | 9 | 77- | 34 | 0 | 0 | 10 | 151 | -173 | 7 | 4 | 10 | 68 | 72 |
| 0 | 5 | 7 | 314 | -276 | 3 | 9 | 7 | 51- | -68 | 6 | 3 | 8 | 411 | -419 | 6 | 7 | 8 | 191 | 215 | 3 | 3 | 9 | 394 | 373 | 1 | 0 | 10 | 377 | -406 | 8 | 4 | 10 | 102 | 149 |
| 1 | 5 | 7 | 119 | -57 | 4 | 9 | 7 | 108 | 129 | 6 | 3 | 8 | 468 | 480 | 6 | 7 | 8 | 237 | -243 | 4 | 3 | 9 | 19- | 10 | 1 | 0 | 10 | 65- | 18 | 8 | 4 | 10 | 177 | 167 |
| 1 | 5 | 7 | 388 | -348 | 5 | 9 | 7 | 39- | 39 | 7 | 3 | 8 | 194 | 182 | 7 | 7 | 8 | 37- | 16 | 4 | 3 | 9 | 317 | 313 | 2 | 0 | 10 | 74 | 94 | 9 | 4 | 10 | 14- | 18 |
| 1 | 5 | 7 | 139 | 122 | 0 | 0 | 8 | 502 | 504 | 7 | 3 | 8 | 231 | 234 | 7 | 7 | 8 | 57- | 26 | 4 | 3 | 9 | 311 | -286 | 2 | 0 | 10 | 79- | 92 | 0 | 5 | 10 | 257 | 272 |
| 1 | 5 | 7 | 102 | -68 | 1 | 0 | 8 | 148 | 139 | 8 | 3 | 8 | 262 | 233 | 0 | 8 | 8 | 191 | 161 | 5 | 3 | 9 | 199 | 180 | 3 | 0 | 10 | 205 | 383 | 0 | 5 | 10 | 99 | 88 |
| 2 | 5 | 7 | 388 | 374 | 1 | 0 | 8 | 77- | 5 | 8 | 3 | 8 | 59- | 8 | 1 | 8 | 8 | 205 | 201 | 5 | 3 | 9 | 445 | -435 | 3 | 0 | 10 | 185 | -183 | 1 | 5 | 10 | 199 | 201 |
| 2 | 5 | 7 | 134 | -80 | 2 | 0 | 8 | 439 | -446 | 9 | 3 | 8 | 102 | 89 | 1 | 8 | 8 | 48- | -38 | 6 | 3 | 9 | 311 | -305 | 4 | 0 | 10 | 428 | -456 | 1 | 5 | 10 | 111 | -114 |
| 2 | 5 | 7 | 425 | 451 | 2 | 0 | 8 | 302 | -304 | 10 | 3 | 8 | 19- | -43 | 2 | 8 | 8 | 65- | -19 | 6 | 3 | 9 | 101 | 11 | 5 | 0 | 10 | 68- | 49 | 1 | 5 | 10 | 42- | -53 |
| 2 | 5 | 7 | 374 | 371 | 3 | 0 | 8 | 122 | 121 | 0 | 4 | 8 | 265 | -254 | 2 | 8 | 8 | 145 | -123 | 7 | 3 | 9 | 62- | -37 | 6 | 0 | 10 | 268 | 264 | 2 | 5 | 10 | 19- | 25 |
| 3 | 5 | 7 | 97 | 56 | 3 | 0 | 8 | 614 | -641 | 0 | 4 | 8 | 228 | -218 | 3 | 8 | 8 | 165 | -165 | 7 | 3 | 9 | 94 | 103 | 7 | 0 | 10 | 154 | 117 | 2 | 5 | 10 | 111 | -98 |
| 3 | 5 | 7 | 271 | 248 | 4 | 0 | 8 | 405 | 385 | 1 | 4 | 8 | 88 | -73 | 3 | 8 | 8 | 151 | -136 | 8 | 3 | 9 | 231 | 200 | 8 | 0 | 10 | 222 | -213 | 2 | 5 | 10 | 154 | -130 |
| 3 | 5 | 7 | 142 | -117 | 4 | 0 | 8 | 62- | -19 | 1 | 4 | 8 | 59- | 43 | 4 | 8 | 8 | 142 | -108 | 8 | 3 | 9 | 51- | 0 | 9 | 0 | 10 | 131 | -91 | 3 | 5 | 10 | 439 | 410 |
| 3 | 5 | 7 | 105 | -62 | 5 | 0 | 8 | 34- | 32 | 1 | 4 | 8 | 417 | -403 | 4 | 8 | 8 | 62 | 64 | 9 | 3 | 9 | 59 | 65 | 0 | 1 | 10 | 182 | -262 | 3 | 5 | 10 | 102 | 73 |
| 4 | 5 | 7 | 217 | -217 | 5 | 0 | 8 | 114 | 125 | 1 | 4 | 8 | 105 | 103 | 5 | 8 | 8 | 262 | 304 | 0 | 4 | 9 | 277 | -280 | 0 | 1 | 10 | 251 | -146 | 4 | 5 | 10 | 237 | 229 |
| 4 | 5 | 7 | 202 | -181 | 6 | 0 | 8 | 185 | -165 | 2 | 4 | 8 | 308 | 298 | 5 | 8 | 8 | 102 | 96 | 0 | 4 | 9 | 65- | 22 | 1 | 1 | 10 | 214 | -202 | 4 | 5 | 10 | 191 | 170 |
| 4 | 5 | 7 | 379 | -395 | 7 | 0 | 8 | 394 | -390 | 2 | 4 | 8 | 368 | 356 | 6 | 8 | 8 | 222 | -260 | 1 | 4 | 9 | 168 | 163 | 1 | 1 | 10 | 462 | -475 | 5 | 5 | 10 | 145 | -138 |
| 4 | 5 | 7 | 439 | -441 | 8 | 0 | 8 | 62- | 55 | 2 | 4 | 8 | 182 | -158 | 0 | 0 | 9 | 154 | 148 | 1 | 4 | 9 | 171 | 168 | 1 | 1 | 10 | 234 | 282 | 5 | 5 | 10 | 54- | 10 |
| 5 | 5 | 7 | 254 | -254 | 9 | 0 | 8 | 142 | 146 | 2 | 4 | 8 | 305 | 293 | 1 | 0 | 9 | 259 | -247 | 1 | 4 | 9 | 171 | -158 | 1 | 1 | 10 | 77 | -68 | 6 | 5 | 10 | 128 | -105 |
| 5 | 5 | 7 | 77- | -23 | 10 | 0 | 8 | 145 | 109 | 3 | 4 | 8 | 92 | -99 | 1 | 0 | 9 | 322 | 317 | 1 | 4 | 9 | 171 | -162 | 2 | 1 | 10 | 359 | 348 | 6 | 5 | 10 | 274 | -226 |
| 5 | 5 | 7 | 282 | -290 | 0 | 1 | 8 | 350 | 351 | 3 | 4 | 8 | 188 | -78 | 2 | 0 | 9 | 351 | -361 | 2 | 4 | 9 | 271 | 246 | 2 | 1 | 10 | 297 | -294 | 7 | 5 | 10 | 91 | -60 |
| 6 | 5 | 7 | 131 | 128 | 0 | 1 | 8 | 342 | 199 | 3 | 4 | 8 | 168 | 170 | 2 | 0 | 9 | 205 | 202 | 2 | 4 | 9 | 85 | 89 | 2 | 1 | 10 | 122 | 108 | 7 | 5 | 10 | 154 | 146 |
| 6 | 5 | 7 | 57- | 43 | 1 | 1 | 8 | 177 | -162 | 3 | 4 | 8 | 448 | 428 | 3 | 0 | 9 | 382 | 381 | 2 | 4 | 9 | 102 | 70 | 2 | 1 | 10 | 99 | 72 | 0 | 6 | 10 | 28- | -37 |
| 7 | 5 | 7 | 94 | 74 | 1 | 1 | 8 | 359 | 357 | 4 | 4 | 8 | 325 | -363 | 3 | 0 | 9 | 434 | -468 | 2 | 4 | 9 | 179 | 169 | 3 | 1 | 10 | 28- | 0 | 1 | 6 | 10 | 102 | -92 |
| 7 | 5 | 7 | 402 | 405 | 1 | 1 | 8 | 188 | -170 | 4 | 4 | 8 | 491 | -480 | 4 | 0 | 9 | 179 | 206 | 3 | 4 | 9 | 155 | -159 | 3 | 1 | 10 | 268 | -272 | 1 | 6 | 10 | 131 | 183 |
| 8 | 5 | 7 | 214 | -197 | 1 | 1 | 8 | 851 | 830 | 4 | 4 | 8 | 148 | -155 | 4 | 0 | 9 | 217 | -218 | 3 | 4 | 9 | 451 | -483 | 3 | 1 | 10 | 225 | -206 | 2 | 6 | 10 | 179 | 143 |
| 8 | 5 | 7 | 62- | 22 | 2 | 1 | 8 | 368 | -337 | 4 | 4 | 8 | 274 | -257 | 5 | 0 | 9 | 268 | 261 | 3 | 4 | 9 | 417 | 416 | 4 | 1 | 10 | 54- | -26 | 2 | 6 | 10 | 117 | -137 |
| 9 | 5 | 7 | 94 | -76 | 2 | 1 | 8 | 291 | -286 | 5 | 4 | 8 | 19- | -32 | 6 | 0 | 9 | 91 | 58 | 3 | 4 | 9 | 434 | 430 | 4 | 1 | 10 | 411 | -407 | 3 | 6 | 10 | 194 | 191 |
| 0 | 6 | 7 | 182 | -191 | 2 | 1 | 8 | 637 | -648 | 5 | 4 | 8 | 454 | -425 | 7 | 0 | 9 | 345 | -340 | 4 | 4 | 9 | 219 | 215 | 5 | 1 | 10 | 357 | 338 | 3 | 6 | 10 | 54 | 39 |
| 0 | 6 | 7 | 105 | -71 | 2 | 1 | 8 | 99- | 48 | 5 | 4 | 8 | 285 | -273 | 8 | 0 | 9 | 328 | -332 | 4 | 4 | 9 | 351 | 345 | 5 | 1 | 10 | 477 | -470 | 4 | 6 | 10 | 62 | -31 |
| 1 | 6 | 7 | 82 | -41 | 3 | 1 | 8 | 262 | 251 | 6 | 4 | 8 | 59 | -64 | 9 | 0 | 9 | 45- | 15 | 5 | 4 | 9 | 99 | -91 | 6 | 1 | 10 | 225 | 208 | 4 | 6 | 10 | 242 | 330 |
| 1 | 6 | 7 | 265 | -256 | 3 | 1 | 8 | 194 | -168 | 6 | 4 | 8 | 191 | 208 | 10 | 0 | 9 | 185 | 158 | 5 | 4 | 9 | 208 | -227 | 6 | 1 | 10 | 88 | 76 | 5 | 6 | 10 | 188 | -222 |
| 1 | 6 | 7 | 411 | 411 | 3 | 1 | 8 | 385 | -385 | 7 | 4 | 8 | 277 | 279 | 0 | 1 | 9 | 311 | -346 | 6 | 4 | 9 | 291 | -268 | 7 | 1 | 10 | 59- | -49 | 5 | 6 | 10 | 128 | 148 |
| 1 | 6 | 7 | 451 | -451 | 3 | 1 | 8 | 111 | -120 | 7 | 4 | 8 | 385 | 401 | 0 | 1 | 9 | 342 | 309 | 6 | 4 | 9 | 45- | -12 | 7 | 1 | 10 | 182 | 185 | 6 | 6 | 10 | 25- | 19 |
| 2 | 6 | 7 | 154 | 128 | 4 | 1 | 8 | 242 | 217 | 8 | 4 | 8 | 145 | 106 | 1 | 1 | 9 | 476 | -472 | 7 | 4 | 9 | 161 | 133 | 8 | 1 | 10 | 265 | -233 | 1 | 7 | 10 | 51- | 0 |
| 2 | 6 | 7 | 97 | 49 | 4 | 1 | 8 | 342 | 326 | 8 | 4 | 8 | 48- | 94 | 1 | 1 | 9 | 65- | -91 | 7 | 4 | 9 | 145 | 155 | 8 | 1 | 10 | 145 | -149 | 2 | 7 | 10 | 97 | 71 |
| 2 | 6 | 7 | 205 | 192 | 4 | 1 | 8 | 256 | 288 | 9 | 4 | 8 | 25- | 15 | 1 | 1 | 9 | 311 | 290 | 8 | 4 | 9 | 85 | 124 | 9 | 1 | 10 | 31- | -28 | 3 | 7 | 10 | 77 | 74 |
| 2 | 6 | 7 | 225 | 210 | 4 | 1 | 8 | 59 | 88 | 0 | 5 | 8 | 245 | -232 | 1 | 1 | 9 | 291 | 269 | 8 | 4 | 9 | 122 | 123 | 0 | 2 | 10 | 274 | -274 | 4 | 7 | 10 | 25- | -19 |
| 3 | 6 | 7 | 45- | -32 | 5 | 1 | 8 | 34- | 29 | 0 | 5 | 8 | 277 | -276 | 2 | 1 | 9 | 174 | 133 | 0 | 5 | 9 | 62- | -52 | 0 | 2 | 10 | 211 | 233 | 4 | 7 | 10 | 82 | 129 |
| 3 | 6 | 7 | 217 | 230 | 5 | 1 | 8 | 402 | 434 | 1 | 5 | 8 | 139 | 127 | 2 | 1 | 9 | 299 | -302 | 0 | 5 | 9 | 102 | -37 | 1 | 2 | 10 | 85 | 69 | 0 | 0 | 11 | 82 | -116 |
| 3 | 6 | 7 | 437 | -463 | 5 | 1 | 8 | 71- | 19 | 1 | 5 | 8 | 334 | -306 | 2 | 1 | 9 | 117 | -95 | 1 | 5 | 9 | 419 | 383 | 1 | 2 | 10 | 388 | -355 | 1 | 0 | 11 | 191 | -186 |
| 3 | 6 | 7 | 337 | 338 | 5 | 1 | 8 | 302 | 310 | 1 | 5 | 8 | 417 | -417 | 2 | 1 | 9 | 139 | 161 | 1 | 5 | 9 | 177 | 167 | 1 | 2 | 10 | 345 | 346 | 1 | 0 | 11 | 51- | 19 |
| 4 | 6 | 7 | 74 | 72 | 6 | 1 | 8 | 328 | -348 | 1 | 5 | 8 | 311 | -282 | 3 | 1 | 9 | 442 | 413 | 1 | 5 | 9 | 214 | -228 | 1 | 2 | 10 | 97 | -126 | 2 | 0 | 11 | 177 | 176 |
| 4 | 6 | 7 | 125 | -106 | 6 | 1 | 8 | 211 | 240 | 2 | 5 | 8 | 159 | 137 | 3 | 1 | 9 | 162 | -135 | 1 | 5 | 9 | 225 | -210 | 2 | 2 | 10 | 48- | 63 | 3 | 0 | 11 | 177 | 179 |
| 4 | 6 | 7 | 191 | -182 | 7 | 1 | 8 | 174 | -186 | 2 | 5 | 8 | 162 | 161 | 3 | 1 | 9 | 608 | -646 | 2 | 5 | 9 | 31- | 5 | 2 | 2 | 10 | 271 | -269 | 4 | 0 | 11 | 359 | -367 |
| 5 | 6 | 7 | 159 | -204 | 7 | 1 | 8 | 337 | -341 | 2 | 5 | 8 | 265 | 279 | 3 | 1 | 9 | 282 | -276 | 2 | 5 | 9 | 337 | 303 | 2 | 2 | 10 | 211 | -232 | 5 | 0 | 11 | 208 | -219 |
| 5 | 6 | 7 | 79 | 61 | 8 | 1 | 8 | 94 | -94 | 2 | 5 | 8 | 305 | 294 | 4 | 1 | 9 | 159 | 173 | 2 | 5 | 9 | 122 | 84 | 2 | 2 | 10 | 351 | 345 | 6 | 0 | 11 | 194 | 158 |
| 5 | 6 | 7 | 359 | -326 | 8 | 1 | 8 | 254 | -290 | 3 | 5 | 8 | 239 | -251 | 4 | 1 | 9 | 228 | 236 | 2 | 5 | 9 | 117 | -100 | 3 | 2 | 10 | 145 | -152 | 7 | 0 | 11 | 134 | 138 |
| 6 | 6 | 7 | 228 | 215 | 9 | 1 | 8 | 99 | 99 | 3 | 5 | 8 | 205 | 177 | 4 | 1 | 9 | 117 | 122 | 3 | 5 | 9 | 79 | -78 | 3 | 2 | 10 | 248 | -260 | 8 | 0 | 11 | 34- | 46 |
| 6 | 6 | 7 | 182 | -182 | 9 | 1 | 8 | 65- | 63 | 3 | 5 | 8 | 231 | 235 | 4 | 1 | 9 | 208 | -202 | 3 | 5 | 9 | 362 | 362 | 3 | 2 | 10 | 214 | 203 | 0 | 1 | 11 | 251 | -356 |
| 7 | 6 | 7 | 162 | 122 | 10 | 1 | 8 | 137 | -115 | 3 | 5 | 8 | 457 | 455 | 5 | 1 | 9 | 125 | 131 | 3 | 5 | 9 | 277 | 281 | 4 | 2 | 10 | 59- | 30 | 0 | 1 | 11 | 254 | -218 |
| 7 | 6 | 7 | 159 | 147 | 0 | 2 | 8 | 134 | -121 | 4 | 5 | 8 | 205 | -205 | 5 | 1 | 9 | 85- | 23 | 4 | 5 | 9 | 122 | -104 | 4 | 2 | 10 | 182 | -165 | 1 | 1 | 11 | 79 | -93 |
| 8 | 6 | 7 | 148 | -140 | 0 | 2 | 8 | 259 | 263 | 4 | 5 | 8 | 222 | -200 | 6 | 1 | 9 | 262 | -249 | 4 | 5 | 9 | 319 | 277 | 5 | 2 | 10 | 214 | 214 | 1 | 1 | 11 | 159 | -190 |
| 8 | 6 | 7 | 151 | 91 | 1 | 2 | 8 | 331 | -283 | 4 | 5 | 8 | 128 | 107 | 6 | 1 | 9 | 425 | 435 | 5 | 5 | 9 | 139 | -107 | 5 | 2 | 10 | 319 | -323 | 1 | 1 | 11 | 91 | 88 |
| 0 | 7 | 7 | 162 | -136 | 1 | 2 | 8 | 174 | 208 | 5 | 5 | 8 | 74- | -42 | 7 | 1 | 9 | 239 | -221 | 5 | 5 | 9 | 139 | 93 | 6 | 2 | 10 | 62 | 31 | 1 | 1 | 11 | 162 | -170 |
| 0 | 7 | 7 | 242 | 219 | 1 | 2 | 8 | 542 | -544 | 5 | 5 | 8 | 197 | -193 | 7 | 1 | 9 | 97 | 90 | 6 | 5 | 9 | 71 | 37 | 6 | 2 | 10 | 197 | -192 | 2 | 1 | 11 | 177 | 185 |
| 1 | 7 | 7 | 131 | 80 | 1 | 2 | 8 | 628 | 625 | 6 | 5 | 8 | 151 | 150 | 8 | 1 | 9 | 237 | -200 | 6 | 5 | 9 | 45- | -45 | 7 | 2 | 10 | 148 | -158 | 2 | 1 | 11 | 162 | 157 |
| 1 | 7 | 7 | 425 | -402 | 2 | 2 | 8 | 114 | 82 | 6 | 5 | 8 | 197 | -180 | 8 | 1 | 9 | 351 | -405 | 7 | 5 | 9 | 219 | 195 | 7 | 2 | 10 | 119 | 130 | 3 | 1 | 11 | 91 | -64 |
| 1 | 7 | 7 | 134 | 118 | 2 | 2 | 8 | 231 | -236 | 7 | 5 | 8 | 271 | 254 | 9 | 1 | 9 | 277 | 229 | 7 | 5 | 9 | 137 | 126 | 8 | 2 | 10 | 82 | -83 | 3 | 1 | 11 | 248 | 246 |
| 1 | 7 | 7 | 397 | -404 | 2 | 2 | 8 | 217 | -199 | 7 | 5 | 8 | 151 | 211 | 9 | 1 | 9 | 57- | -46 | 8 | 5 | 9 | 282 | 255 | 8 | 2 | 10 | 65- | -29 | 4 | 1 | 11 | 317 | -303 |
| 2 | 7 | 7 | 51- | 63 | 2 | 2 | 8 | 479 | 466 | 8 | 5 | 8 | 62 | 39 | 10 | 1 | 9 | 37- | 10 | 8 | 5 | 9 | 262 | 315 | 9 | 2 | 10 | 317 | 279 | 4 | 1 | 11 | 114 | -114 |
| 2 | 7 | 7 | 237 | -233 | 3 | 2 | 8 | 391 | 370 | 8 | 5 | 8 | 208 | 168 | 0 | 2 | 9 | 302 | -313 | 9 | 5 | 9 | 28- | 14 | 0 | 3 | 10 | 57- | 0 | 5 | 1 | 11 | 151 | 147 |

**Table III.** (Continued)

| h | k | l | $10F_o$ | $10F_c$ | h | k | l | $10F_o$ | $10F_c$ | h | k | l | $10F_o$ | $10F_c$ | h | k | l | $10F_o$ | $10F_c$ | h | k | l | $10F_o$ | $10F_c$ | h | k | l | $10F_o$ | $10F_c$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | 1 | 11 | 222 | -237 | 3 | 2 | 11 | 85 | -81 | 2 | 3 | 11 | 54- | 39 | 1 | 4 | 11 | 274 | 266 | 1 | 5 | 11 | 54 | -35 | 4 | 0 | 12 | 34- | 20 | 6 | 1 | 12 | 99 | 97 |
| 6 | 1 | 11 | 342 | 304 | 3 | 2 | 11 | 214 | 222 | 2 | 3 | 11 | 279 | -275 | 1 | 4 | 11 | 25- | -29 | 2 | 5 | 11 | 245 | -295 | 5 | 0 | 12 | 151 | -154 | 6 | 1 | 12 | 105 | -102 |
| 6 | 1 | 11 | 99 | -95 | 4 | 2 | 11 | 48- | -12 | 3 | 3 | 11 | 54- | -40 | 2 | 4 | 11 | 85 | -122 | 2 | 5 | 11 | 60- | -72 | 6 | 0 | 12 | 94 | 78 | 1 | 2 | 12 | 180 | 271 |
| 7 | 1 | 11 | 245 | 208 | 4 | 2 | 11 | 57- | -26 | 3 | 3 | 11 | 54- | 33 | 2 | 4 | 11 | 151 | -150 | 3 | 5 | 11 | 45- | 61 | 1 | 1 | 12 | 105 | 81 | 2 | 2 | 12 | 202 | 205 |
| 7 | 1 | 11 | 174 | 167 | 5 | 2 | 11 | 159 | 184 | 4 | 3 | 11 | 39- | -32 | 3 | 4 | 11 | 208 | -199 | 3 | 5 | 11 | 74- | -84 | 1 | 1 | 12 | 320 | -333 | 3 | 2 | 12 | 79 | -92 |
| 8 | 1 | 11 | 31- | 19 | 5 | 2 | 11 | 68 | -73 | 4 | 3 | 11 | 39- | 39 | 3 | 4 | 11 | 45- | -41 | 4 | 5 | 11 | 271 | 273 | 2 | 1 | 12 | 348 | 394 | 4 | 2 | 12 | 114 | -129 |
| 8 | 1 | 11 | 39- | 28 | 6 | 2 | 11 | 374 | 362 | 5 | 3 | 11 | 205 | 225 | 4 | 4 | 11 | 199 | 195 | 4 | 5 | 11 | 102 | 194 | 2 | 1 | 12 | 85 | -112 | 5 | 2 | 12 | 39- | -49 |
| 0 | 2 | 11 | 174 | -195 | 6 | 2 | 11 | 162 | -171 | 5 | 3 | 11 | 205 | -198 | 4 | 4 | 11 | 174 | 152 | 5 | 5 | 11 | 74 | 63 | 3 | 1 | 12 | 148 | 179 | 6 | 2 | 12 | 262 | 250 |
| 0 | 2 | 11 | 139 | -139 | 7 | 2 | 11 | 90 | -23 | 6 | 3 | 11 | 99 | 98 | 5 | 4 | 11 | 194 | 172 | 5 | 5 | 11 | 154 | 206 | 3 | 1 | 12 | 111 | 133 | 2 | 3 | 12 | 93 | 95 |
| 1 | 2 | 11 | 277 | -331 | 7 | 2 | 11 | 119 | 116 | 6 | 3 | 11 | 242 | -216 | 5 | 4 | 11 | 42- | -22 | 6 | 5 | 11 | 19- | -12 | 4 | 1 | 12 | 151 | -144 | 3 | 3 | 12 | 74 | -77 |
| 1 | 2 | 11 | 299 | 337 | 8 | 2 | 11 | 45 | -193 | 7 | 3 | 11 | 322 | -296 | 6 | 4 | 11 | 45 | -36 | 1 | 0 | 12 | 91 | -121 | 4 | 1 | 12 | 117 | 124 | 4 | 3 | 12 | 28- | -18 |
| 1 | 2 | 11 | 531 | -542 | 0 | 3 | 11 | 271 | 239 | 7 | 3 | 11 | 42- | -2 | 6 | 4 | 11 | 354 | -379 | 2 | 0 | 12 | 134 | 141 | 5 | 1 | 12 | 39- | -50 | 4 | 3 | 12 | 94 | -95 |
| 2 | 2 | 11 | 65- | -11 | 1 | 3 | 11 | 259 | 325 | 0 | 4 | 11 | 305 | 280 | 7 | 4 | 11 | 168 | -151 | 3 | 0 | 12 | 357 | 384 | 5 | 1 | 12 | 45- | -64 | 5 | 3 | 12 | 20- | 4 |
| 2 | 2 | 11 | 68- | -59 | 1 | 3 | 11 | 254 | -310 | | | | | | | | | | | | | | | | | | | | | | | | | |

**Table IV.** Distances and angles

| | |
|---|---|
| Cd–O(2) = 2.29(2) Å | S(2)CdS(4) = 112.9(1)° |
| Cd–S(2) = 2.52(1) | S(3)CdS(4) = 87.5(1) |
| Cd–S(3) = 2.60(1) | S(2)CdO(2) = 98.8(4) |
| Cd–S(4) = 2.63(2) | S(3)CdO(2) = 145.7(4) |
| S(2)CdS(3) = 113.3(1)° | S(4)CdO(2) = 91.0(4) |

(*b*) in the thiourea molecules

| | |
|---|---|
| S(2)–C(1) = 1.73(2) Å | S(2)C(1)N(2) = 121.8(1.1)° |
| N(1)–C(1) = 1.31(2) | S(2)C(1)N(1) = 116.3(1.2) |
| N(2)–C(1) = 1.31(2) | N(2)C(1)N(1) = 121.7(1.6) |
| S(3)–C(2) = 1.76(2) | S(3)C(2)N(4) = 121.1(8) |
| N(3)–C(2) = 1.33(2) | S(3)C(2)N(3) = 114.5(9) |
| N(4)–C(2) = 1.29(2) | N(3)C(2)N(4) = 124.4(1.1) |
| S(4)–C(3) = 1.72(1) | S(4)C(3)N(5) = 116.8(1.0) |
| N(5)–C(3) = 1.32(2) | S(4)C(3)N(6) = 122.4(1.1) |
| N(6)–C(3) = 1.33(2) | N(5)C(3)N(6) = 120.7(1.3) |

(*c*) in the $SO_4^{2-}$ group

| | |
|---|---|
| S(1)–O(1) = 1.46(2) Å | O(1)S(1)O(2) = 106.1(1.0)° |
| S(1)–O(2) = 1.51(2) | O(1)S(1)O(3) = 109.9(8) |
| S(1)–O(3) = 1.48(2) | O(1)S(1)O(4) = 112.6(7) |
| S(1)–O(4) = 1.47(2) | O(2)S(1)O(3) = 109.7(9) |
| | O(2)S(1)O(4) = 109.8(1.0) |
| | O(3)S(1)O(4) = 108.8(8) |

(*d*) hydrogen-bonds

| | | | |
|---|---|---|---|
| N(1)...O(3$^{ii}$) | = 2.85(3) Å | N(1)HO(3$^{ii}$) | = 158.8° |
| N(1)...O(2$^{iii}$) | = 2.94(3) | N(1)HO(2$^{iii}$) | = 147.5 |
| N(2)...O(1$^{ii}$) | = 3.09(3) | N(2)HO(1$^{ii}$) | = 161.5 |
| N(3)...O(4$^{iv}$) | = 2.77(3) | N(3)HO(4$^{iv}$) | = 167.8 |
| N(4)...O(1) | = 2.90(2) | N(4)HO(1) | = 160.7 |
| N(5)...O(4$^{v}$) | = 3.00(2) | N(5)HO(4$^{v}$) | = 141.6 |
| N(6)...O(2) | = 2.89(3) | N(6)HO(2) | = 165.0 |
| N(6)...O(4$^{v}$) | = 2.91(2) | N(6)HO(4$^{v}$) | = 147.0 |

(*e*) contacts less than 3.5 Å

| | | | |
|---|---|---|---|
| S(2)...N(4$^{i}$) | = 3.44(2) Å | O(3)...N(2$^{vii}$) | = 3.29(2) Å |
| S(3)...O(1$^{i}$) | = 3.39(3) | O(3)...C(1$^{vii}$) | = 3.48(3) |
| S(3)...O(2$^{i}$) | = 3.49(2) | O(3)...N(1$^{iii}$) | = 3.03(3) |
| S(4)...N(5$^{vi}$) | = 3.47(2) | O(4)...C(3$^{v}$) | = 3.37(2) |

i $\bar{x}, \bar{y}, \bar{z}$ — v $1-x, 1-y, 1-z$
ii $x+1, y, z$ — vi $1-x, 1-y, \bar{z}$
iii $1-x, \bar{y}, 1-z$ — vii $x-1, y, z$
iv $\bar{x}, 1-y, \bar{z}$

ment with those generally found in octahedral cadmium complexes: 2.65 Å in *mono*(thiourea)cadmium sulphate dihydrate;[13] 2.60 Å in *bis*(ethylenthiourea)-cadmium thiocyanate.[14]

Further analysis of the cadmium environment shows stant from the metal respectively. The long Cd–S(3$^{i}$) contact corresponds well to the sum of the ionic radii, while the Cd–O(1) distance is much longer than the sum of their ionic radii (2.43 Å). Considering these interactions too, the coordination polyhedron around the metal is a very distorted octahedron. The S(3) and S(3$^{i}$) atoms act as bridges between two centrosymmetrical cadmium atoms, giving origin to a dimer formed by two octahedra sharing the S(3)–S(3$^{i}$) edge. The sulphate group behaves as a bidentate ligand, the two bonds it forms being quite different in length. Considering these distances and $d^{10}$ configuration of $Cd^{2+}$ it is impossible to make any sound discussion on the nature of the metal-ligands interactions.

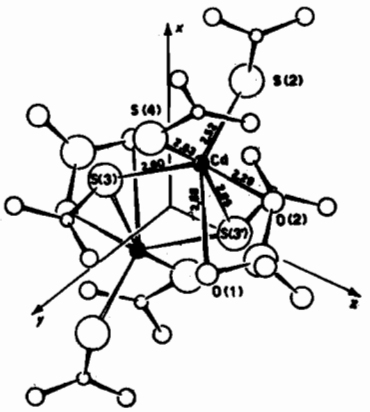


Figure 1. Clinographic projection of a dimer.

Concerning bond distances and angles in the thiourea molecules it seems interesting to observe that the longer S–C distance (S(3)–C(2) = 1.76(2) Å is found in the thiourea molecule whose sulphur is in a bridging position, while the shorter ones (S(2)–C(1) = 1.73(2) and S(4)–C(3) = 1.72(1) Å) are present in the monocoordinate molecules, confirming the idea that coordination can influence the S–C distance in thiourea.[13] In fact the bridging behaviour implies an $sp^3$ bond configuration for sulphur and a single bond

(13) L. Cavalca, P. Domiano, G. Fava Gasparri, and P. Boldrini, *Acta Cryst.*, *22*, 878 (1967).
(14) L. Cavalca, M. Nardelli, and G. Fava Gasparri, *Acta Cryst.*, *13*, 125 (1960).

character for S(3)–C(2). This is also confirmed by the angles around S(3): CdS(3)C(2) = 107.0°, CdS(3)-Cd$^{i}$ = 97.5°, Cd$^{i}$S(3)C(2) = 109.2°. Nor any π interaction seems probable as indicated by the dihedral angles: CdS(3)C(2) ∧ S(3)C(2)N(3)N(4) = 38.6°

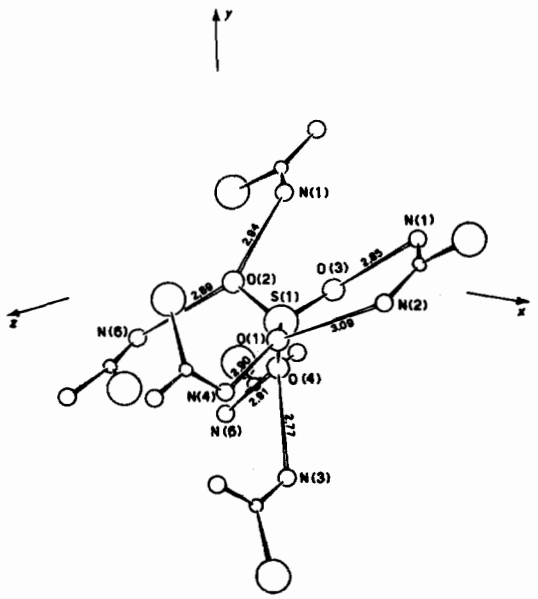


Figure 2. Clinographic projection of the $SO_4^{2-}$ environment.

and Cd$^{i}$S(3)C(2) ∧ S(3)C(2)N(3)N(4) = 24.5° which are far from 90°. Also for the other thiourea molecules coordination to the metal atom occurs through interactions concerning pairs of electrons which are in molecular orbitals not much different from the $sp^3$ sulphur hybrids, as indicated by the angles: CdS(2)-C(1) = 103.0, CdS(4)C(3) = 109.3. For these molecules too, no interactions between metal and π electrons of the ligands seem implied as indicated by the dihedral angles the molecules of thiourea form with the CdSC planes: CdS(2)C(1) ∧ S(2)C(1)N(1)N(2) = 54.9°, CdS(4)C(3) ∧ S(4)C(3)N(5)N(6) = 22.6°.

The thiourea molecules are planar excepting S(2)-C(1)N(1)N(2), which shows a small but statistically significant deviation: C(1) is out of the mean plane by –0.03 Å.*

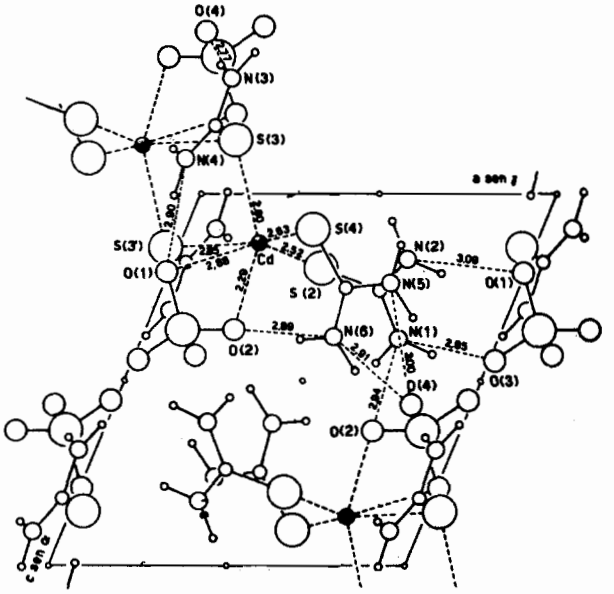


Figure 3. Projection of the structure down to [010].

Bond distances and angles in the $SO_4^{2-}$ group, agree well with those generally found in other sulphates. It may be pointed out that the longer S–O distance (S(1)–O(2) = 1.51(2) Å) corresponds to the shorter Cd–O contact (Cd–O(2) = 2.29(2) Å) and this indicates a reduced double-bond character for the S(1)–O(2) bond as a consequence of the binding with the metal. The coordinated electronpair is in a $SO_4^{2-}$ molecular orbital which is essentially an $sp^3$ hybrid of oxygen, as indicated by the angle CdO(2)S(1) = 112.4(1.1)°.

Packing is mainly due to the hydrogen bonds (s. Table IV) formed by the $NH_2$ groups and the oxygen atoms, as shown in Figure 2 and 3.

(*) The least-squares planes of the three molecules are: S(2)C(1)-N(1)N(2) 0.5422 $X'$—0.7413 $Y'$—0.3957 $Z'$ = 1.7015; S(3)C(2)N(3)N(4) 0.8277 $X'$+0.3552 $Y'$+0.4344 $Z'$ = 0.4529; S(4)C(3)N(5)N(6)—0.5934 $X'$+ 0.7902 $Y'$+0.1530 $Z'$ = 0.9319. The orthogonal $X'$, $Y'$, $Z'$ coordinates are expressed in Å and are obtained from the $x$, $y$, $z$ triclinic ones using the matrix: (sin γ 0 —sin α cos β* | cos γ 1 cos α | 0 0 sin α sin β*).