NEW LIMITATION CHANGE

TO
Approved for public release, distribution unlimited

FROM
Distribution: No Foreign.

AUTHORITY
ONR ltr., 26 Oct 1977
THE CRYSTAL STRUCTURE OF ZINC 8-HYDROXYQUINOLINATE DIIYDRATE

By Lynne L. Merritt, Jr., Richard T. Cady* and Belvey W. Bundy

Department of Chemistry, Indiana University, Bloomington, Indiana, U.S.A.

(Received )

Contribution No. 000 from the Chemical Laboratories of Indiana University.

Present address, Burnside Laboratories, E. I. DuPont de Nemours and Company, Penns Grove, New Jersey, U.S.A.

Present address, Department of Chemistry, Virginia Military Institute, Lexington, Virginia, U.S.A.

Abstracted from thesis submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy at Indiana University.

SUMMARY

The crystal structure of zinc 8-hydroxyquinolate dihydrate, Zn(C₆H₄N₃)₂·2H₂O has been determined by single crystal methods. The unit cell is monoclinic with:

a = 11.28 Å, b = 5.42 Å, c = 13.16 Å, β = 106° 18' 

The space group is P2₁/a - C₅₃₂₆ and there are two molecules per unit cell.

Atomic positions were determined by Fourier projections and were refined by a three-dimensional Fourier electron-density synthesis and by the method of least squares. Structure factors were obtained from visually estimated intensities on Weissenberg photographs taken with Cu Kα radiation.

The molecule, with the exception of the water molecules, is essentially planar. Including the water molecules, there is a sort of distorted octahedral arrangement of bonds around the central zinc ion. The Zn-O and Zn-N bond lengths are 2.05 Å and 2.06 Å, respectively, while the Zn-CH₂ bond length is 2.27 Å.

INTRODUCTION

This report is the second in a series from these Laboratories dealing with the crystal structure of organic reagents of analytical importance and the complexes they form with metallic ions. The first report (Merritt and Lanterman, 1952) concerned the structure of dimethylglyoxime. Unlike dimethylglyoxime which is quite selective in its action, 8-hydroxyquinoline reacts with a large number of different ions.

Experimental Technique, Unit Cell and Space Group

Single crystals of zinc 8-hydroxyquinolate dihydrate are quite difficult to prepare. The zinc salt is precipitated from an acetic acid solution by addition of a slight excess of a 5% solution of 8-hydroxyquinoline in 12% acetic acid and subsequent neutralization with dilute ammonium hydroxide. The precipitate consists of very small crystals which give a powder pattern identical with that of powdered single dihydrate crystals. This finely crystalline precipitate is washed thoroughly with hot water to remove any excess 8-hydroxyquinoline and then
is dissolved in pyridine. Water is added to the pyridine solution, kept at about 80°C until a precipitate begins to form. The precipitate is redissolved by adding a little pyridine and the whole solution is cooled slowly, in an oven, to room temperature. Cooling over a period of two or three days yields crystals of usable size, however, most crystals are lamellar twins, twinning plane (011). Only rarely does one find a good single crystal. The crystals are pale yellow and translucent. The refractive indices were determined by the usual immersion methods to be

\[
\begin{align*}
  a &= 1.650 \pm 0.002 \\
  b &= 1.78 \pm 0.02 \\
  c &= 1.82 \pm 0.02 \\
  \gamma &= 91.82
\end{align*}
\]

Sign of refraction = +

So few well-formed single crystals were available that the orientation of the indicatrix was not thoroughly established; however, \( b = \gamma \)

The unit cell dimensions were obtained from oscillation photographs and from Weissenberg photographs employing the method of \( \omega \) separations (Buerger 1942).

The results are

\[
\begin{align*}
  a &= 11.28 \text{Å} \\
  b &= 5.42 \text{Å} \\
  c &= 13.16 \text{Å} \\
  \beta &= 106° 18' 
\end{align*}
\]

The density by the flotation method is 1.662 g/cm\(^3\) which gives 1.98, i.e., 2 molecules per unit cell. By an unusual coincidence in this crystal, pointed out by Hughes (1950), there exists a good check on the consistency of the values of \( a, b \) and \( c \). On Weissenberg photographs of twinned crystals rotated about the \([100]\) axis, every third layer where \( h = 0, 6 \text{ or } 12 \) consists of single spots whereas otherwise the spots are doublets. Only when all of the spots begin to be resolved into \( K_1 \) and \( K_2 \) doubles are these spots on every third layer resolved into three or four spots. This indicates that the reciprocal lattice moves \( 20° \) in going \( 6a \) so that using the values of \( a \) and \( c \) found previously:

\[
\cos \beta = \frac{c}{b} = \frac{a}{c}
\]

(1)

and

\[
\beta = 106° 36'
\]

(2)

This value of \( \beta \) checks well with that found above.

Complete sets of equi-inclination Weissenberg photographs about the \([100]\) and \([010]\) axis were taken for intensity estimation. The crystals used were roughly 1 mm long by 0.2 mm in diameter. No corrections for absorption were made. Copper K\(_\alpha\) radiation filtered through nickel was employed and relative intensities were estimated visually by comparison with a standard intensity strip prepared by making a series of timed exposures of the (202) reflection. The multiple film technique of Robertson (1943) was employed using four sheets of Eastman No-Screen X-ray film and a factor of 3.7 for the decrease in intensity on passage of the beam through one layer of film. The usual corrections for the Lorentz and polarization factors, the oblique penetration of the film by the X-rays for non-equatorial layer photographs, and the relative time factor of Cox and Shaw (1930) were applied. The zero layer Weissenberg film about \([100]\) was taken as the standard film and by cross calibration all intensities were reduced to this common level. Relative \( I_0 \) values were calculated.

Systematic absences were noted for \( hkl \) when \( h \) is odd

\( \theta k \theta \) when \( k \) is odd

\( h00 \) when \( h \) is odd

with the single exception that an extremely weak reflection was observed at the
place where (010) should occur. If this is a true reflection then the space group could be P2/a or P/c. The external morphology of the crystal shows a two-fold axis of symmetry which would fix the space group as P2/a. However, it is impossible to pack the required two molecules satisfactorily in the unit cell in this space group with the short b axis existing in this crystal. Therefore it appears certain that the correct space group is P2 - Csh and that the very weak (010) reflection is most probably due to an internal reflection or perhaps to some slight disorder in the (010) direction.

**Determination of Atomic Positions**

A Patterson projection, Figure 1, upon (010) is sufficiently well resolved to yield a trial structure. Contour lines in Figure 1 are drawn at arbitrary levels of 100; the zero contour being dotted. Crosses represent the ultimate positions of projected vectors between the zinc atom and the other atoms of the same molecule.

Structure factors, Fh01, were calculated for this trial structure. Atomic scattering factors were taken from the Internationale Tabellen with corrections applied to those for zinc due to dispersion of the K electrons (James 1950). Since the zinc atom contributes to all of the 182 terms of this zone, nearly all signs are positive. Actually the signs of 154 terms appeared to be definitely fixed so that they could be included in the first Fourier projection. Three Fourier projections served to refine the x and z parameters. Only a very few of the weaker terms changed sign in the process of refinement. The third Fourier projection on (010) is shown in Figure 2. Contours are drawn at intervals of 1.0 e\(^{-}\)Atoms except near the origin where the contour interval is 5.0 e\(^{-}\). The one electron contour is dotted and the crosses show the final positions of the projected atomic centers after the structure determination was completed. For comparison purposes the final structure is shown as if projected on (010) in Figure 3.

After each projection a temperature and scale factor was determined by the method of least-squares using the following equation to represent the relationship between Fo and Fc.

\[
k|Fo| = |Fc| \exp (-b \left(\frac{\sin \theta}{\lambda}\right)^{2})
\]

(3)

The value of \( R = \frac{\sum |Fo - Fc|}{\sum Fo} \) decreased from 0.81 to 0.18 and 0.16; during the process of these refinements. Centers of peaks were determined by the method of Carpenter and Donohue (1950). After the x and z parameters were established by the projection on (010) an estimate of the tilt of the molecule was made by measuring the bond lengths in the benzene and pyridine rings, in projection, and comparing these lengths with the expected values. It was estimated that the molecule was tilted about 49° around an axis nearly perpendicular to [100] and lying in the (010) plane. From this information the y parameters were estimated and the structure factors for all reflections were calculated. By trial and error it was discovered that better agreement between |Fo| and |Fc| could be obtained if the angle of tilt were increased to 50°. At this point it was decided to carry out the refinement with a three-dimensional Fourier synthesis, since ordinary projections along (100) or (001) would not show many resolved atoms.

Slight corrections were obtained from the three-dimensional density function. It appears that the molecule is tilted about 50.5° around an axis inclined 94° to [100] and also which makes a slight angle of 3 3/4° with the (010) plane.

A least-squares refinement of the parameters according to the method of Hughes (1941) completed the structure determination. All of the 1636 reflections within the region investigated were included in this treatment. Only the diagonal terms were calculated and used in solving the normal equations. The final corrections from the least-squares method averaged 0.025A\(^{-}\) per parameter with a
maximum of 0.10Å in the z parameter of the C₁ atom. Final parameters for the
atoms are given in Table I. The final values of \( F₀ \) and \( F_c \) are given in Table II.
The final value of \( B \), the exponent in the temperature factor expression, was
\( 2.23 \times 10^{-16} \text{ cm}^2 \).

There are 213 unobserved reflections. If those for which \( F_c \) is below the
minimum observable value for the region of the film in which the reflection should
occur are not counted but those for which \( F_c \) would indicate the reflection should
have been observed are taken at the minimum observable value of \( F_c \), then \( R \) turns
out to be 0.226. If these 213 reflections are left out altogether \( R \) would be 0.219.

The calculations of the Fourier density functions, structure factors and
least-squares refinement were carried out with the aid of I.B.M. machines
(Donohue and Schomaker, 1949; Shaffer, Schomaker and Pauling, 1946).

TABLE I

<table>
<thead>
<tr>
<th>Atomic Parameters of Zinc 8-hydroxyquinolinate Dihydrate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atom</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>C₁</td>
</tr>
<tr>
<td>C₂</td>
</tr>
<tr>
<td>C₃</td>
</tr>
<tr>
<td>C₄</td>
</tr>
<tr>
<td>C₅</td>
</tr>
<tr>
<td>C₆</td>
</tr>
<tr>
<td>C₇</td>
</tr>
<tr>
<td>C₈</td>
</tr>
<tr>
<td>C₉</td>
</tr>
<tr>
<td>O₁</td>
</tr>
<tr>
<td>O₂</td>
</tr>
<tr>
<td>N₁</td>
</tr>
<tr>
<td>Zn</td>
</tr>
</tbody>
</table>
Discussion of Structure

The dimensions of a single asymmetric unit are presented in Figure 3 and Table III. Because of the presence of a heavy atom in the structure the positions of the lighter atoms cannot be fixed as accurately as desired. It seems probable that errors in bond distances between light atoms may be as high as 0.06 to 0.08 Å. Judging by the bond lengths in the benzene and pyridine ring and little weight should be placed on the irregularities in these rings. The lengths of the bonds around the zinc atom, which are the most interesting in this crystal, are undoubtedly more precise due to the exact knowledge of the position of the zinc ion and should not be in error by more than about 0.03 to 0.04 Å.

It would appear that the major distortions in bond angles which result from the formation of the five-membered ring are in the angles around the zinc ion and around the nitrogen atom. The Zn - N - O angle has been decreased significantly from the expected angle of 120°.

The arrangement around the zinc atom is that of a distorted octahedron. This is shown schematically in Figure 4. The bond angle of 79.6° between the oxygen, zinc and nitrogen atoms of the main part of the molecule probably represents a sort of compromise due to the rigid structure of the organic chelating molecule and the inability to approach closer to the zinc atom without causing too short bonds and too large a negative charge upon the zinc atom. A somewhat similar distorted octahedral arrangement is found in nickel glycine dihydrate (Stosick, 1945). If the ligands were free to move as necessary then a more regular octahedral structure would be expected such as was observed by Tang and Sturdivant (1952) in manganese chloride dihydrate-hexamethylene diamine complex.

The zinc atom has a closed third electron shell and therefore the bonding of the six groups must be through use of the $4s$, $4p^3$, and $4d^2$ orbitals. This would be similar to the case of the above mentioned manganese complex where magnetic susceptibility measurements have shown five unpaired electrons. There is undoubtedly considerable ionic character in these bonds.

From the normal covalent radii ascribed to oxygen (0.66 Å) and to nitrogen (0.70 Å) and the Zn=O, and Zn-N bond distances in this crystal, it appears that the octahedral covalent radius of the zinc atom is about 1.36 Å. Pauling (1945) lists 1.31 Å as the covalent covalent radius of zinc. The increase of about 0.07 Å seems reasonable if the unstable 4d orbitals are involved at all.

The water molecules are much less firmly attached to the zinc atom than is the organic molecule as shown by the greater Zn-O₂ distance and confirmed by the fact that the compound loses these water molecules on drying above 135°C. The anhydrous complex is undoubtedly tetrahedral since Liu and Bailar (1951) have been able to resolve the anhydrous zinc complex of 8-hydroxyquinoline-5-sulfonic acid into optically active isomers. Lundy (1948) has shown that the copper 8-hydroxyquinolate complex exists in two forms, an anhydrous form with space group $P2_1/2$ and four atoms per unit cell and a dihydrate isomorphous with the zinc complex. According to this observation, there is no reason why the anhydrous form, at least of the copper complex, should not be tetrahedral. It is interesting to note that the resolved compounds of Liu and Bailar are easily racemized on standing in water which might indicate that they pick up two water molecules and revert to the structure shown in this report.

The molecules in zinc 8-hydroxyquinolate dihydrate show no unusually close approaches. The smallest intermolecular distance is 3.45 Å between adjacent water molecules. The closest approach of carbon atoms is 3.47 Å. These distances
eliminate the possibility of hydrogen bonding and indicate that molecular binding in the crystal is mainly through van der Waals forces.

The hydrogen atoms, which altogether contribute 8% of the scattering matter of the unit cell, were neglected entirely in this determination. Inclusion of the hydrogens would probably improve slightly the agreement between observed and calculated structure factors. It is also probable that an anisotropic temperature factor would materially improve the agreement. A root-mean-square displacement of the atoms of 0.17Å is indicated from the value of B in the temperature factor expression.

The atoms of the 8-hydroxyquinoline molecules and the zinc atom all lie in a plane within the limits of experimental error except perhaps for the oxygen atom, O, which seems to be about 0.10Å below the least-squares-best plane. If the five-membered ring alone is considered, none of the atoms in this ring are more than 0.05Å from a plane. The equation of the least-squares-best plane for the whole asymmetric unit in terms of the unit cell vectors is

\[ a = 0.3994b - 0.2554c = 0 \]  \hspace{1cm} (4)

The average deviation of atoms from this plane is 0.03Å and the maximum deviation is 0.10Å for the oxygen atom, O.

**ACKNOWLEDGEMENTS**

The authors gratefully acknowledge the following aid which has made possible this and other structure determinations to be reported later: The Research Corporation for a Frederick Gardner Cottrell grant for purchase of instruments, the Graduate School of Indiana University for a grant-in-aid to help punch master data used in structural calculations, the E. I. DuPont de Nemours and Company for a fellowship for one of us (R.T.C.) during the year 1950-1 and the Office of Naval Research for extensive support under contract Nonr-191 (00), NR 052-245.
### TABLE III

Interatomic Distances and Angles in Zinc 8-Hydroxyquinolinate Dihydrate Crystal

<table>
<thead>
<tr>
<th>Bond</th>
<th>Distance</th>
<th>Bonds</th>
<th>Angle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zn-O₁</td>
<td>2.05Å</td>
<td>O₁-Zn-N</td>
<td>79.8°</td>
</tr>
<tr>
<td>Zn-N</td>
<td>2.06</td>
<td>O₁-Zn-O₉</td>
<td>94.6°</td>
</tr>
<tr>
<td>Zn-O₂</td>
<td>2.27</td>
<td>N-Zn-O₂</td>
<td>92.7°</td>
</tr>
<tr>
<td>N-C₁</td>
<td>1.33</td>
<td>Zn-N-C₈</td>
<td>111.8</td>
</tr>
<tr>
<td>C₁-C₂</td>
<td>1.38</td>
<td>N-C₈-C₇</td>
<td>116.1</td>
</tr>
<tr>
<td>C₂-C₃</td>
<td>1.40</td>
<td>C₈-C₇-O₁</td>
<td>117.4</td>
</tr>
<tr>
<td>C₃-C₉</td>
<td>1.42</td>
<td>C₇-O₉-Zn</td>
<td>114.3</td>
</tr>
<tr>
<td>C₈-C₉</td>
<td>1.40</td>
<td>N-C₁-C₂</td>
<td>120.9</td>
</tr>
<tr>
<td>C₆-N</td>
<td>1.37</td>
<td>C₁-C₂-C₃</td>
<td>119.9</td>
</tr>
<tr>
<td>C₄-C₉</td>
<td>1.32</td>
<td>C₂-C₃-C₉</td>
<td>121.1</td>
</tr>
<tr>
<td>C₄-C₅</td>
<td>1.41</td>
<td>C₃-C₉-C₈</td>
<td>113.5</td>
</tr>
<tr>
<td>C₅-C₆</td>
<td>1.34</td>
<td>C₈-C₈-N</td>
<td>125.1</td>
</tr>
<tr>
<td>C₆-C₇</td>
<td>1.37</td>
<td>C₈-N-C₁</td>
<td>119.0</td>
</tr>
<tr>
<td>C₇-C₈</td>
<td>1.44</td>
<td>C₇-C₈-C₉</td>
<td>118.8</td>
</tr>
<tr>
<td>C₇-O₁</td>
<td>1.29</td>
<td>C₈-C₈-O₄</td>
<td>121.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>C₉-C₄-C₅</td>
<td>120.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>C₄-C₅-C₆</td>
<td>120.6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>C₅-C₆-C₇</td>
<td>121.6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>C₆-C₇-C₈</td>
<td>117.8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>C₆-C₇-O₁</td>
<td>121.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Zn-N-C₁</td>
<td>128.9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>C₃-C₈-C₄</td>
<td>125.6</td>
</tr>
</tbody>
</table>
References


TABLE II

Observed and Calculated Structure Factors

The reflections in the following table are listed in groups with \( h \) and \( k \) constant in each group. The first column gives the \( l \) index, the second gives the calculated structure factor, and the third gives the observed structure factor. All values of structure factors have been multiplied by ten to eliminate decimals.

<table>
<thead>
<tr>
<th>( l )</th>
<th>( F_0 )</th>
<th>( F_0 )</th>
<th>( l )</th>
<th>( F_0 )</th>
<th>( F_0 )</th>
<th>( l )</th>
<th>( F_0 )</th>
<th>( F_0 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>-36</td>
<td>57</td>
<td>6</td>
<td>216</td>
<td>221</td>
<td>13</td>
<td>72</td>
<td>85</td>
</tr>
<tr>
<td>3</td>
<td>669</td>
<td>920</td>
<td>7</td>
<td>218</td>
<td>219</td>
<td>14</td>
<td>70</td>
<td>80</td>
</tr>
<tr>
<td>4</td>
<td>273</td>
<td>336</td>
<td>8</td>
<td>268</td>
<td>267</td>
<td>15</td>
<td>68</td>
<td>80</td>
</tr>
<tr>
<td>5</td>
<td>767</td>
<td>1005</td>
<td>9</td>
<td>315</td>
<td>315</td>
<td>16</td>
<td>66</td>
<td>72</td>
</tr>
<tr>
<td>6</td>
<td>589</td>
<td>766</td>
<td>10</td>
<td>322</td>
<td>73</td>
<td>17</td>
<td>63</td>
<td>72</td>
</tr>
<tr>
<td>7</td>
<td>1189</td>
<td>129</td>
<td>11</td>
<td>328</td>
<td>28</td>
<td>18</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>8</td>
<td>279</td>
<td>314</td>
<td>12</td>
<td>331</td>
<td>136</td>
<td>19</td>
<td>58</td>
<td>56</td>
</tr>
<tr>
<td>9</td>
<td>236</td>
<td>320</td>
<td>13</td>
<td>62</td>
<td>97</td>
<td>20</td>
<td>55</td>
<td>95</td>
</tr>
<tr>
<td>10</td>
<td>235</td>
<td>315</td>
<td>14</td>
<td>77</td>
<td>115</td>
<td>21</td>
<td>53</td>
<td>80</td>
</tr>
<tr>
<td>11</td>
<td>271</td>
<td>326</td>
<td>15</td>
<td>49</td>
<td>71</td>
<td>22</td>
<td>51</td>
<td>70</td>
</tr>
<tr>
<td>12</td>
<td>299</td>
<td>375</td>
<td>16</td>
<td>3</td>
<td>33</td>
<td>23</td>
<td>50</td>
<td>60</td>
</tr>
<tr>
<td>13</td>
<td>274</td>
<td>361</td>
<td>17</td>
<td>31</td>
<td>22</td>
<td>24</td>
<td>49</td>
<td>50</td>
</tr>
<tr>
<td>14</td>
<td>188</td>
<td>133</td>
<td>18</td>
<td>45</td>
<td>21</td>
<td>25</td>
<td>48</td>
<td>48</td>
</tr>
<tr>
<td>15</td>
<td>103</td>
<td>94</td>
<td>19</td>
<td>40</td>
<td>20</td>
<td>26</td>
<td>47</td>
<td>47</td>
</tr>
<tr>
<td>16</td>
<td>150</td>
<td>173</td>
<td>20</td>
<td>35</td>
<td>19</td>
<td>27</td>
<td>46</td>
<td>46</td>
</tr>
<tr>
<td>001</td>
<td>150</td>
<td>112</td>
<td>21</td>
<td>30</td>
<td>18</td>
<td>28</td>
<td>45</td>
<td>45</td>
</tr>
<tr>
<td>01</td>
<td>95</td>
<td>94</td>
<td>22</td>
<td>25</td>
<td>17</td>
<td>29</td>
<td>44</td>
<td>44</td>
</tr>
<tr>
<td>02</td>
<td>261</td>
<td>241</td>
<td>23</td>
<td>20</td>
<td>16</td>
<td>30</td>
<td>43</td>
<td>43</td>
</tr>
<tr>
<td>03</td>
<td>153</td>
<td>127</td>
<td>24</td>
<td>15</td>
<td>15</td>
<td>31</td>
<td>42</td>
<td>42</td>
</tr>
<tr>
<td>04</td>
<td>230</td>
<td>250</td>
<td>25</td>
<td>10</td>
<td>14</td>
<td>32</td>
<td>41</td>
<td>41</td>
</tr>
<tr>
<td>05</td>
<td>166</td>
<td>170</td>
<td>26</td>
<td>5</td>
<td>13</td>
<td>33</td>
<td>40</td>
<td>40</td>
</tr>
<tr>
<td>06</td>
<td>-12-2</td>
<td>122</td>
<td>27</td>
<td>10</td>
<td>12</td>
<td>34</td>
<td>39</td>
<td>39</td>
</tr>
<tr>
<td>07</td>
<td>121</td>
<td>60</td>
<td>28</td>
<td>10</td>
<td>11</td>
<td>35</td>
<td>38</td>
<td>38</td>
</tr>
<tr>
<td>08</td>
<td>121</td>
<td>121</td>
<td>29</td>
<td>10</td>
<td>11</td>
<td>36</td>
<td>37</td>
<td>37</td>
</tr>
<tr>
<td>09</td>
<td>121</td>
<td>53</td>
<td>30</td>
<td>10</td>
<td>11</td>
<td>37</td>
<td>36</td>
<td>36</td>
</tr>
<tr>
<td>10</td>
<td>-12-2</td>
<td>126</td>
<td>31</td>
<td>10</td>
<td>11</td>
<td>38</td>
<td>35</td>
<td>35</td>
</tr>
<tr>
<td>11</td>
<td>120</td>
<td>23</td>
<td>32</td>
<td>10</td>
<td>11</td>
<td>39</td>
<td>34</td>
<td>34</td>
</tr>
<tr>
<td>12</td>
<td>-12-2</td>
<td>126</td>
<td>33</td>
<td>10</td>
<td>11</td>
<td>40</td>
<td>33</td>
<td>33</td>
</tr>
<tr>
<td>13</td>
<td>120</td>
<td>60</td>
<td>34</td>
<td>10</td>
<td>11</td>
<td>41</td>
<td>32</td>
<td>32</td>
</tr>
<tr>
<td>14</td>
<td>-12-2</td>
<td>126</td>
<td>35</td>
<td>10</td>
<td>11</td>
<td>42</td>
<td>31</td>
<td>31</td>
</tr>
<tr>
<td>15</td>
<td>120</td>
<td>23</td>
<td>36</td>
<td>10</td>
<td>11</td>
<td>43</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>16</td>
<td>-12-2</td>
<td>126</td>
<td>37</td>
<td>10</td>
<td>11</td>
<td>44</td>
<td>29</td>
<td>29</td>
</tr>
<tr>
<td>001</td>
<td>0</td>
<td>0</td>
<td>38</td>
<td>10</td>
<td>11</td>
<td>45</td>
<td>28</td>
<td>28</td>
</tr>
<tr>
<td>01</td>
<td>0</td>
<td>0</td>
<td>39</td>
<td>10</td>
<td>11</td>
<td>46</td>
<td>27</td>
<td>27</td>
</tr>
<tr>
<td>02</td>
<td>0</td>
<td>0</td>
<td>40</td>
<td>10</td>
<td>11</td>
<td>47</td>
<td>26</td>
<td>26</td>
</tr>
<tr>
<td>03</td>
<td>0</td>
<td>0</td>
<td>41</td>
<td>10</td>
<td>11</td>
<td>48</td>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td>04</td>
<td>0</td>
<td>0</td>
<td>42</td>
<td>10</td>
<td>11</td>
<td>49</td>
<td>24</td>
<td>24</td>
</tr>
<tr>
<td>05</td>
<td>0</td>
<td>0</td>
<td>43</td>
<td>10</td>
<td>11</td>
<td>50</td>
<td>23</td>
<td>23</td>
</tr>
<tr>
<td>06</td>
<td>0</td>
<td>0</td>
<td>44</td>
<td>10</td>
<td>11</td>
<td>51</td>
<td>22</td>
<td>22</td>
</tr>
<tr>
<td>07</td>
<td>0</td>
<td>0</td>
<td>45</td>
<td>10</td>
<td>11</td>
<td>52</td>
<td>21</td>
<td>21</td>
</tr>
<tr>
<td>08</td>
<td>0</td>
<td>0</td>
<td>46</td>
<td>10</td>
<td>11</td>
<td>53</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>09</td>
<td>0</td>
<td>0</td>
<td>47</td>
<td>10</td>
<td>11</td>
<td>54</td>
<td>19</td>
<td>19</td>
</tr>
<tr>
<td>10</td>
<td>0</td>
<td>0</td>
<td>48</td>
<td>10</td>
<td>11</td>
<td>55</td>
<td>18</td>
<td>18</td>
</tr>
<tr>
<td>11</td>
<td>0</td>
<td>0</td>
<td>49</td>
<td>10</td>
<td>11</td>
<td>56</td>
<td>17</td>
<td>17</td>
</tr>
<tr>
<td>12</td>
<td>0</td>
<td>0</td>
<td>50</td>
<td>10</td>
<td>11</td>
<td>57</td>
<td>16</td>
<td>16</td>
</tr>
<tr>
<td>13</td>
<td>0</td>
<td>0</td>
<td>51</td>
<td>10</td>
<td>11</td>
<td>58</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>14</td>
<td>0</td>
<td>0</td>
<td>52</td>
<td>10</td>
<td>11</td>
<td>59</td>
<td>14</td>
<td>14</td>
</tr>
<tr>
<td>15</td>
<td>0</td>
<td>0</td>
<td>53</td>
<td>10</td>
<td>11</td>
<td>60</td>
<td>13</td>
<td>13</td>
</tr>
<tr>
<td>16</td>
<td>0</td>
<td>0</td>
<td>54</td>
<td>10</td>
<td>11</td>
<td>61</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>001</td>
<td>0</td>
<td>0</td>
<td>55</td>
<td>10</td>
<td>11</td>
<td>62</td>
<td>11</td>
<td>11</td>
</tr>
<tr>
<td>01</td>
<td>0</td>
<td>0</td>
<td>56</td>
<td>10</td>
<td>11</td>
<td>63</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>02</td>
<td>0</td>
<td>0</td>
<td>57</td>
<td>10</td>
<td>11</td>
<td>64</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>03</td>
<td>0</td>
<td>0</td>
<td>58</td>
<td>10</td>
<td>11</td>
<td>65</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>04</td>
<td>0</td>
<td>0</td>
<td>59</td>
<td>10</td>
<td>11</td>
<td>66</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>05</td>
<td>0</td>
<td>0</td>
<td>60</td>
<td>10</td>
<td>11</td>
<td>67</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>06</td>
<td>0</td>
<td>0</td>
<td>61</td>
<td>10</td>
<td>11</td>
<td>68</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>07</td>
<td>0</td>
<td>0</td>
<td>62</td>
<td>10</td>
<td>11</td>
<td>69</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>08</td>
<td>0</td>
<td>0</td>
<td>63</td>
<td>10</td>
<td>11</td>
<td>70</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>09</td>
<td>0</td>
<td>0</td>
<td>64</td>
<td>10</td>
<td>11</td>
<td>71</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>10</td>
<td>0</td>
<td>0</td>
<td>65</td>
<td>10</td>
<td>11</td>
<td>72</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>11</td>
<td>0</td>
<td>0</td>
<td>66</td>
<td>10</td>
<td>11</td>
<td>73</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Fe</td>
<td>Fo</td>
<td></td>
<td>Fe</td>
<td>Fo</td>
<td></td>
<td>Fe</td>
<td>Fo</td>
</tr>
<tr>
<td>---</td>
<td>-----</td>
<td>-----</td>
<td>---</td>
<td>-----</td>
<td>-----</td>
<td>---</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td>12</td>
<td>135</td>
<td>136</td>
<td>13</td>
<td>-37</td>
<td>23</td>
<td>13</td>
<td>-23</td>
<td>&lt; 11</td>
</tr>
<tr>
<td>14</td>
<td>98</td>
<td>141</td>
<td>14</td>
<td>37</td>
<td>25</td>
<td>15</td>
<td>-25</td>
<td>32</td>
</tr>
<tr>
<td>15</td>
<td>84</td>
<td>96</td>
<td>15</td>
<td>-29</td>
<td>14</td>
<td>16</td>
<td>40</td>
<td>&lt; 11</td>
</tr>
<tr>
<td>17</td>
<td>5</td>
<td>55</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>708</td>
<td>513</td>
<td>2</td>
<td>-33</td>
<td>25</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>276</td>
<td>267</td>
<td>3</td>
<td>-173</td>
<td>122</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>351</td>
<td>363</td>
<td>4</td>
<td>-116</td>
<td>73</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>152</td>
<td>135</td>
<td>5</td>
<td>-56</td>
<td>25</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>362</td>
<td>321</td>
<td>6</td>
<td>-128</td>
<td>92</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>32</td>
<td>473</td>
<td>471</td>
<td>7</td>
<td>-23</td>
<td>I11</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>34</td>
<td>234</td>
<td>216</td>
<td>8</td>
<td>111</td>
<td>156</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>36</td>
<td>167</td>
<td>166</td>
<td>9</td>
<td>164</td>
<td>156</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>38</td>
<td>319</td>
<td>335</td>
<td>10</td>
<td>170</td>
<td>191</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>288</td>
<td>196</td>
<td>11</td>
<td>33</td>
<td>41</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>42</td>
<td>116</td>
<td>168</td>
<td>12</td>
<td>33</td>
<td>41</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>44</td>
<td>212</td>
<td>202</td>
<td>13</td>
<td>70</td>
<td>97</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>46</td>
<td>125</td>
<td>119</td>
<td>14</td>
<td>128</td>
<td>122</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>48</td>
<td>115</td>
<td>126</td>
<td>15</td>
<td>39</td>
<td>55</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>50</td>
<td>27</td>
<td>28</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>52</td>
<td>121</td>
<td>131</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>54</td>
<td>71</td>
<td>96</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>56</td>
<td>219</td>
<td>225</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>58</td>
<td>155</td>
<td>151</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>60</td>
<td>86</td>
<td>85</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>62</td>
<td>128</td>
<td>108</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>64</td>
<td>70</td>
<td>76</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>66</td>
<td>70</td>
<td>50</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>68</td>
<td>56</td>
<td>53</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>70</td>
<td>-15</td>
<td>27</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>72</td>
<td>118</td>
<td>161</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>74</td>
<td>161</td>
<td>145</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>76</td>
<td>198</td>
<td>202</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>78</td>
<td>93</td>
<td>71</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>80</td>
<td>10</td>
<td>41</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>82</td>
<td>31</td>
<td>50</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>84</td>
<td>-241</td>
<td>152</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>86</td>
<td>150</td>
<td>136</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>88</td>
<td>11</td>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>l</td>
<td>Fo</td>
<td>Fo</td>
<td>l</td>
<td>Fo</td>
<td>Fo</td>
<td>l</td>
<td>Fo</td>
<td>Fo</td>
</tr>
<tr>
<td>---</td>
<td>----</td>
<td>----</td>
<td>---</td>
<td>----</td>
<td>----</td>
<td>---</td>
<td>----</td>
<td>----</td>
</tr>
<tr>
<td>5</td>
<td>-22</td>
<td>14</td>
<td>1</td>
<td>521</td>
<td>162</td>
<td>2</td>
<td>111</td>
<td>313</td>
</tr>
<tr>
<td>6</td>
<td>74</td>
<td>34</td>
<td>2</td>
<td>256</td>
<td>213</td>
<td>3</td>
<td>563</td>
<td>411</td>
</tr>
<tr>
<td>7</td>
<td>20</td>
<td>6</td>
<td>3</td>
<td>126</td>
<td>306</td>
<td>4</td>
<td>466</td>
<td>566</td>
</tr>
<tr>
<td>8</td>
<td>168</td>
<td>145</td>
<td>5</td>
<td>319</td>
<td>235</td>
<td>5</td>
<td>350</td>
<td>313</td>
</tr>
<tr>
<td>9</td>
<td>27</td>
<td>2</td>
<td>6</td>
<td>118</td>
<td>60</td>
<td>6</td>
<td>375</td>
<td>276</td>
</tr>
<tr>
<td>10</td>
<td>168</td>
<td>145</td>
<td>7</td>
<td>247</td>
<td>232</td>
<td>8</td>
<td>153</td>
<td>191</td>
</tr>
<tr>
<td>11</td>
<td>27</td>
<td>2</td>
<td>9</td>
<td>70</td>
<td>50</td>
<td>9</td>
<td>313</td>
<td>297</td>
</tr>
<tr>
<td>12</td>
<td>30</td>
<td>39</td>
<td>10</td>
<td>111</td>
<td>25</td>
<td>11</td>
<td>170</td>
<td>166</td>
</tr>
<tr>
<td>13</td>
<td>5</td>
<td>25</td>
<td>12</td>
<td>20</td>
<td>22</td>
<td>13</td>
<td>185</td>
<td>135</td>
</tr>
<tr>
<td>14</td>
<td>238</td>
<td>212</td>
<td>14</td>
<td>563</td>
<td>411</td>
<td>15</td>
<td>121</td>
<td>106</td>
</tr>
<tr>
<td>15</td>
<td>563</td>
<td>411</td>
<td>16</td>
<td>82</td>
<td>60</td>
<td>200</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>l</th>
<th>Fo</th>
<th>Fo</th>
<th>l</th>
<th>Fo</th>
<th>Fo</th>
<th>l</th>
<th>Fo</th>
<th>Fo</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>521</td>
<td>162</td>
<td>2</td>
<td>111</td>
<td>313</td>
<td>2</td>
<td>111</td>
<td>313</td>
</tr>
<tr>
<td>2</td>
<td>256</td>
<td>213</td>
<td>3</td>
<td>560</td>
<td>411</td>
<td>3</td>
<td>466</td>
<td>566</td>
</tr>
<tr>
<td>3</td>
<td>126</td>
<td>306</td>
<td>4</td>
<td>319</td>
<td>235</td>
<td>4</td>
<td>350</td>
<td>313</td>
</tr>
<tr>
<td>4</td>
<td>6</td>
<td>118</td>
<td>5</td>
<td>247</td>
<td>232</td>
<td>5</td>
<td>375</td>
<td>276</td>
</tr>
<tr>
<td>5</td>
<td>247</td>
<td>232</td>
<td>6</td>
<td>153</td>
<td>191</td>
<td>6</td>
<td>170</td>
<td>166</td>
</tr>
<tr>
<td>6</td>
<td>70</td>
<td>50</td>
<td>7</td>
<td>313</td>
<td>297</td>
<td>7</td>
<td>185</td>
<td>135</td>
</tr>
<tr>
<td>7</td>
<td>20</td>
<td>22</td>
<td>8</td>
<td>563</td>
<td>411</td>
<td>8</td>
<td>121</td>
<td>106</td>
</tr>
<tr>
<td>8</td>
<td>30</td>
<td>39</td>
<td>9</td>
<td>82</td>
<td>60</td>
<td>9</td>
<td>170</td>
<td>166</td>
</tr>
<tr>
<td>9</td>
<td>238</td>
<td>212</td>
<td>10</td>
<td>563</td>
<td>411</td>
<td>10</td>
<td>121</td>
<td>106</td>
</tr>
<tr>
<td>10</td>
<td>563</td>
<td>411</td>
<td>11</td>
<td>82</td>
<td>60</td>
<td>11</td>
<td>170</td>
<td>166</td>
</tr>
<tr>
<td>11</td>
<td>238</td>
<td>212</td>
<td>12</td>
<td>563</td>
<td>411</td>
<td>12</td>
<td>121</td>
<td>106</td>
</tr>
<tr>
<td>12</td>
<td>238</td>
<td>212</td>
<td>13</td>
<td>82</td>
<td>60</td>
<td>13</td>
<td>170</td>
<td>166</td>
</tr>
<tr>
<td>13</td>
<td>238</td>
<td>212</td>
<td>14</td>
<td>563</td>
<td>411</td>
<td>14</td>
<td>121</td>
<td>106</td>
</tr>
<tr>
<td>14</td>
<td>238</td>
<td>212</td>
<td>15</td>
<td>82</td>
<td>60</td>
<td>15</td>
<td>170</td>
<td>166</td>
</tr>
<tr>
<td>15</td>
<td>238</td>
<td>212</td>
<td>16</td>
<td>563</td>
<td>411</td>
<td>16</td>
<td>170</td>
<td>166</td>
</tr>
<tr>
<td>16</td>
<td>238</td>
<td>212</td>
<td>17</td>
<td>563</td>
<td>411</td>
<td>17</td>
<td>170</td>
<td>166</td>
</tr>
<tr>
<td>17</td>
<td>238</td>
<td>212</td>
<td>18</td>
<td>563</td>
<td>411</td>
<td>18</td>
<td>170</td>
<td>166</td>
</tr>
<tr>
<td>18</td>
<td>238</td>
<td>212</td>
<td>19</td>
<td>563</td>
<td>411</td>
<td>19</td>
<td>170</td>
<td>166</td>
</tr>
<tr>
<td>19</td>
<td>238</td>
<td>212</td>
<td>20</td>
<td>563</td>
<td>411</td>
<td>20</td>
<td>170</td>
<td>166</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>l</th>
<th>Fo</th>
<th>Fo</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>597</td>
<td>513</td>
</tr>
<tr>
<td>1</td>
<td>465</td>
<td>352</td>
</tr>
<tr>
<td>2</td>
<td>291</td>
<td>235</td>
</tr>
<tr>
<td>1</td>
<td>Fe</td>
<td>Fo</td>
</tr>
<tr>
<td>----</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td>3</td>
<td>3.1</td>
<td>2.12</td>
</tr>
<tr>
<td>4</td>
<td>132</td>
<td>136</td>
</tr>
<tr>
<td>5</td>
<td>67</td>
<td>69</td>
</tr>
<tr>
<td>6</td>
<td>91</td>
<td>73</td>
</tr>
<tr>
<td>7</td>
<td>103</td>
<td>94</td>
</tr>
<tr>
<td>8</td>
<td>132</td>
<td>103</td>
</tr>
<tr>
<td>9</td>
<td>1.6</td>
<td>1.2</td>
</tr>
<tr>
<td>10</td>
<td>2.1</td>
<td>3.4</td>
</tr>
<tr>
<td>11</td>
<td>93</td>
<td>72</td>
</tr>
<tr>
<td>12</td>
<td>2.6</td>
<td>3.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>2.47</td>
<td>1.1</td>
</tr>
<tr>
<td>2</td>
<td>124</td>
<td>372</td>
</tr>
<tr>
<td>3</td>
<td>1.15</td>
<td>53</td>
</tr>
<tr>
<td>4</td>
<td>1.66</td>
<td>1.75</td>
</tr>
<tr>
<td>5</td>
<td>1.36</td>
<td>1.27</td>
</tr>
<tr>
<td>6</td>
<td>1.82</td>
<td>1.59</td>
</tr>
<tr>
<td>7</td>
<td>1.7</td>
<td>7.3</td>
</tr>
<tr>
<td>8</td>
<td>1.65</td>
<td>1.9</td>
</tr>
<tr>
<td>9</td>
<td>1.91</td>
<td>1.36</td>
</tr>
<tr>
<td>10</td>
<td>2.57</td>
<td>1.51</td>
</tr>
<tr>
<td>11</td>
<td>1.95</td>
<td>1.9</td>
</tr>
<tr>
<td>12</td>
<td>1.31</td>
<td>1.10</td>
</tr>
<tr>
<td>13</td>
<td>1.1</td>
<td>1.61</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>89</td>
<td>50</td>
</tr>
<tr>
<td>1</td>
<td>1.41</td>
<td>1.25</td>
</tr>
<tr>
<td>2</td>
<td>98</td>
<td>67</td>
</tr>
<tr>
<td>3</td>
<td>1.13</td>
<td>1.51</td>
</tr>
<tr>
<td>4</td>
<td>1.4</td>
<td>1.23</td>
</tr>
<tr>
<td>5</td>
<td>70</td>
<td>50</td>
</tr>
<tr>
<td>6</td>
<td>36</td>
<td>65</td>
</tr>
<tr>
<td>7</td>
<td>58</td>
<td>1.4</td>
</tr>
<tr>
<td>8</td>
<td>1.68</td>
<td>1.1</td>
</tr>
<tr>
<td>9</td>
<td>1.41</td>
<td>3.2</td>
</tr>
<tr>
<td>10</td>
<td>-25</td>
<td>&lt;12</td>
</tr>
<tr>
<td></td>
<td>251</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>1.42</td>
<td>3.4</td>
</tr>
<tr>
<td>12</td>
<td>1.81</td>
<td>1.22</td>
</tr>
<tr>
<td>13</td>
<td>1.66</td>
<td>0.97</td>
</tr>
<tr>
<td>14</td>
<td>-1.06</td>
<td>0.67</td>
</tr>
<tr>
<td>15</td>
<td>-1.23</td>
<td>&lt;23</td>
</tr>
<tr>
<td>16</td>
<td>-1.31</td>
<td>2.3</td>
</tr>
<tr>
<td>17</td>
<td>2.20</td>
<td>&lt;23</td>
</tr>
<tr>
<td>18</td>
<td>-1.50</td>
<td>9.9</td>
</tr>
<tr>
<td>19</td>
<td>-1.33</td>
<td>65</td>
</tr>
<tr>
<td>20</td>
<td>1.30</td>
<td>&lt;23</td>
</tr>
<tr>
<td>21</td>
<td>-1.4</td>
<td>16</td>
</tr>
<tr>
<td>22</td>
<td>-1.4</td>
<td>&lt;16</td>
</tr>
<tr>
<td>1</td>
<td>Fc</td>
<td>Fo</td>
</tr>
<tr>
<td>----</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td>10</td>
<td>-12</td>
<td>9</td>
</tr>
<tr>
<td>11</td>
<td>136</td>
<td>37</td>
</tr>
<tr>
<td>12</td>
<td>66</td>
<td>65</td>
</tr>
<tr>
<td>13</td>
<td>127</td>
<td>127</td>
</tr>
<tr>
<td>14</td>
<td>281</td>
<td>281</td>
</tr>
<tr>
<td>15</td>
<td>226</td>
<td>226</td>
</tr>
<tr>
<td>16</td>
<td>131</td>
<td>131</td>
</tr>
<tr>
<td>17</td>
<td>124</td>
<td>127</td>
</tr>
<tr>
<td>18</td>
<td>180</td>
<td>180</td>
</tr>
<tr>
<td>19</td>
<td>167</td>
<td>167</td>
</tr>
<tr>
<td>20</td>
<td>43</td>
<td>43</td>
</tr>
<tr>
<td>21</td>
<td>131</td>
<td>131</td>
</tr>
<tr>
<td>22</td>
<td>131</td>
<td>131</td>
</tr>
<tr>
<td>23</td>
<td>107</td>
<td>107</td>
</tr>
<tr>
<td>24</td>
<td>40</td>
<td>40</td>
</tr>
<tr>
<td>25</td>
<td>341</td>
<td>341</td>
</tr>
<tr>
<td>26</td>
<td>56</td>
<td>56</td>
</tr>
<tr>
<td>27</td>
<td>61</td>
<td>61</td>
</tr>
<tr>
<td>28</td>
<td>19</td>
<td>19</td>
</tr>
<tr>
<td>29</td>
<td>67</td>
<td>67</td>
</tr>
<tr>
<td>30</td>
<td>88</td>
<td>88</td>
</tr>
<tr>
<td>31</td>
<td>84</td>
<td>84</td>
</tr>
<tr>
<td>32</td>
<td>421</td>
<td>421</td>
</tr>
<tr>
<td>33</td>
<td>67</td>
<td>67</td>
</tr>
<tr>
<td>34</td>
<td>14</td>
<td>14</td>
</tr>
<tr>
<td>35</td>
<td>361</td>
<td>361</td>
</tr>
<tr>
<td>36</td>
<td>16</td>
<td>16</td>
</tr>
<tr>
<td>37</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>38</td>
<td>361</td>
<td>361</td>
</tr>
<tr>
<td>39</td>
<td>16</td>
<td>16</td>
</tr>
<tr>
<td>40</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>41</td>
<td>361</td>
<td>361</td>
</tr>
<tr>
<td>42</td>
<td>16</td>
<td>16</td>
</tr>
<tr>
<td>43</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>44</td>
<td>361</td>
<td>361</td>
</tr>
<tr>
<td>45</td>
<td>16</td>
<td>16</td>
</tr>
<tr>
<td>46</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>47</td>
<td>361</td>
<td>361</td>
</tr>
<tr>
<td>48</td>
<td>16</td>
<td>16</td>
</tr>
<tr>
<td>49</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>50</td>
<td>361</td>
<td>361</td>
</tr>
<tr>
<td>51</td>
<td>16</td>
<td>16</td>
</tr>
<tr>
<td>52</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>53</td>
<td>361</td>
<td>361</td>
</tr>
</tbody>
</table>

**Note:** The table appears to be a listing of numbers, possibly for a scientific or mathematical context, but the specific purpose is unclear from the image alone.
<table>
<thead>
<tr>
<th></th>
<th>Fe</th>
<th>Fo</th>
<th></th>
<th>Fe</th>
<th>Fo</th>
<th></th>
<th>Fe</th>
<th>Fo</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5</td>
<td>213</td>
<td>1</td>
<td>7</td>
<td>55</td>
<td>21</td>
<td>9</td>
<td>72</td>
</tr>
<tr>
<td>2</td>
<td>11</td>
<td>177</td>
<td>2</td>
<td>12</td>
<td>270</td>
<td>21</td>
<td>13</td>
<td>25</td>
</tr>
<tr>
<td>3</td>
<td>11</td>
<td>177</td>
<td>3</td>
<td>12</td>
<td>143</td>
<td>21</td>
<td>14</td>
<td>19</td>
</tr>
<tr>
<td>4</td>
<td>11</td>
<td>177</td>
<td>4</td>
<td>12</td>
<td>143</td>
<td>21</td>
<td>15</td>
<td>19</td>
</tr>
<tr>
<td>5</td>
<td>11</td>
<td>177</td>
<td>5</td>
<td>12</td>
<td>143</td>
<td>21</td>
<td>16</td>
<td>19</td>
</tr>
<tr>
<td>6</td>
<td>11</td>
<td>177</td>
<td>6</td>
<td>12</td>
<td>143</td>
<td>21</td>
<td>17</td>
<td>19</td>
</tr>
<tr>
<td>7</td>
<td>11</td>
<td>177</td>
<td>7</td>
<td>12</td>
<td>143</td>
<td>21</td>
<td>18</td>
<td>19</td>
</tr>
<tr>
<td>8</td>
<td>11</td>
<td>177</td>
<td>8</td>
<td>12</td>
<td>143</td>
<td>21</td>
<td>19</td>
<td>19</td>
</tr>
<tr>
<td>9</td>
<td>11</td>
<td>177</td>
<td>9</td>
<td>12</td>
<td>143</td>
<td>21</td>
<td>20</td>
<td>19</td>
</tr>
<tr>
<td>10</td>
<td>11</td>
<td>177</td>
<td>10</td>
<td>12</td>
<td>143</td>
<td>21</td>
<td>21</td>
<td>19</td>
</tr>
</tbody>
</table>

The table continues with more rows of data.
<table>
<thead>
<tr>
<th></th>
<th>Fc</th>
<th>Fo</th>
<th></th>
<th>Fc</th>
<th>Fo</th>
<th></th>
<th>Fc</th>
<th>Fo</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>290</td>
<td>280</td>
<td>7</td>
<td>106</td>
<td>71</td>
<td>9</td>
<td>88</td>
<td>61</td>
</tr>
<tr>
<td>2</td>
<td>364</td>
<td>391</td>
<td>8</td>
<td>-55</td>
<td>55</td>
<td>10</td>
<td>-15</td>
<td>12</td>
</tr>
<tr>
<td>3</td>
<td>342</td>
<td>349</td>
<td>9</td>
<td>-54</td>
<td>50</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>120</td>
<td>152</td>
<td>10</td>
<td>-28</td>
<td>23</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>294</td>
<td>271</td>
<td>11</td>
<td>-12</td>
<td>30</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>119</td>
<td>136</td>
<td>12</td>
<td>-62</td>
<td>53</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>71</td>
<td>106</td>
<td>13</td>
<td>16</td>
<td>21</td>
<td>4</td>
<td>5</td>
<td>23</td>
</tr>
<tr>
<td>8</td>
<td>150</td>
<td>135</td>
<td>14</td>
<td>10</td>
<td>49</td>
<td>5</td>
<td>25</td>
<td>50</td>
</tr>
<tr>
<td>9</td>
<td>105</td>
<td>106</td>
<td>15</td>
<td>17</td>
<td>46</td>
<td>6</td>
<td>59</td>
<td>23</td>
</tr>
<tr>
<td>10</td>
<td>70</td>
<td>63</td>
<td></td>
<td></td>
<td></td>
<td>16</td>
<td>88</td>
<td>61</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Fc</th>
<th>Fo</th>
<th></th>
<th>Fc</th>
<th>Fo</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>531</td>
<td></td>
<td>2</td>
<td>210</td>
<td>179</td>
</tr>
<tr>
<td>3</td>
<td>538</td>
<td>512</td>
<td>4</td>
<td>299</td>
<td>257</td>
</tr>
<tr>
<td>5</td>
<td>292</td>
<td></td>
<td>6</td>
<td>182</td>
<td>179</td>
</tr>
<tr>
<td>6</td>
<td>195</td>
<td>317</td>
<td>8</td>
<td>186</td>
<td>206</td>
</tr>
<tr>
<td>7</td>
<td>321</td>
<td>112</td>
<td>10</td>
<td>186</td>
<td>189</td>
</tr>
<tr>
<td>8</td>
<td>199</td>
<td>179</td>
<td>11</td>
<td>67</td>
<td>127</td>
</tr>
<tr>
<td>9</td>
<td>280</td>
<td>271</td>
<td>12</td>
<td>181</td>
<td>191</td>
</tr>
<tr>
<td>10</td>
<td>253</td>
<td>262</td>
<td>13</td>
<td>88</td>
<td>189</td>
</tr>
<tr>
<td>11</td>
<td>260</td>
<td>133</td>
<td>14</td>
<td>75</td>
<td>80</td>
</tr>
<tr>
<td>12</td>
<td>73</td>
<td>76</td>
<td>15</td>
<td>111</td>
<td>112</td>
</tr>
<tr>
<td>13</td>
<td>69</td>
<td>97</td>
<td>16</td>
<td>84</td>
<td>76</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Fc</th>
<th>Fo</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>127</td>
<td>140</td>
</tr>
<tr>
<td>2</td>
<td>128</td>
<td>120</td>
</tr>
<tr>
<td>3</td>
<td>521</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Fc</th>
<th>Fo</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>164</td>
<td>184</td>
</tr>
<tr>
<td>2</td>
<td>21</td>
<td>74</td>
</tr>
<tr>
<td>3</td>
<td>121</td>
<td>112</td>
</tr>
<tr>
<td>4</td>
<td>30</td>
<td>21</td>
</tr>
<tr>
<td>5</td>
<td>63</td>
<td>64</td>
</tr>
<tr>
<td>6</td>
<td>37</td>
<td>37</td>
</tr>
<tr>
<td>7</td>
<td>143</td>
<td>143</td>
</tr>
<tr>
<td>8</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>9</td>
<td>19</td>
<td>19</td>
</tr>
<tr>
<td>10</td>
<td>21</td>
<td>21</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Fc</th>
<th>Fo</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>521</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Fc</th>
<th>Fo</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>-30</td>
<td>&lt;23</td>
</tr>
<tr>
<td>2</td>
<td>-12</td>
<td>25</td>
</tr>
<tr>
<td>3</td>
<td>-27</td>
<td>57</td>
</tr>
<tr>
<td>4</td>
<td>-32</td>
<td>74</td>
</tr>
<tr>
<td>5</td>
<td>-3</td>
<td>&lt;21</td>
</tr>
<tr>
<td>6</td>
<td>-79</td>
<td>50</td>
</tr>
<tr>
<td>7</td>
<td>-102</td>
<td>4.2</td>
</tr>
<tr>
<td></td>
<td>Fo</td>
<td>Fo</td>
</tr>
<tr>
<td>---</td>
<td>----</td>
<td>----</td>
</tr>
<tr>
<td>1</td>
<td>50</td>
<td>69</td>
</tr>
<tr>
<td>2</td>
<td>331</td>
<td>50</td>
</tr>
<tr>
<td>3</td>
<td>471</td>
<td>23</td>
</tr>
<tr>
<td>4</td>
<td>12</td>
<td>19</td>
</tr>
<tr>
<td>5</td>
<td>681</td>
<td>195</td>
</tr>
<tr>
<td>6</td>
<td>135</td>
<td>227</td>
</tr>
<tr>
<td>7</td>
<td>382</td>
<td>574</td>
</tr>
<tr>
<td>8</td>
<td>292</td>
<td>139</td>
</tr>
<tr>
<td>9</td>
<td>268</td>
<td>140</td>
</tr>
<tr>
<td>10</td>
<td>292</td>
<td>396</td>
</tr>
<tr>
<td>11</td>
<td>343</td>
<td>370</td>
</tr>
<tr>
<td>12</td>
<td>216</td>
<td>269</td>
</tr>
<tr>
<td>13</td>
<td>121</td>
<td>216</td>
</tr>
<tr>
<td>14</td>
<td>186</td>
<td>234</td>
</tr>
<tr>
<td>15</td>
<td>108</td>
<td>135</td>
</tr>
<tr>
<td>16</td>
<td>98</td>
<td>138</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Fo</th>
<th>Fo</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>111</td>
<td>110</td>
</tr>
<tr>
<td>2</td>
<td>83</td>
<td>76</td>
</tr>
<tr>
<td>3</td>
<td>50</td>
<td>43</td>
</tr>
<tr>
<td>4</td>
<td>6</td>
<td>30</td>
</tr>
<tr>
<td>5</td>
<td>30</td>
<td>25</td>
</tr>
<tr>
<td>6</td>
<td>18</td>
<td>14</td>
</tr>
<tr>
<td>7</td>
<td>11</td>
<td>10</td>
</tr>
<tr>
<td>8</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td>9</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>10</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>11</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>12</td>
<td>10</td>
<td>8</td>
</tr>
<tr>
<td>13</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>14</td>
<td>10</td>
<td>8</td>
</tr>
<tr>
<td>15</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>16</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Fo</th>
<th>Fo</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>152</td>
<td>127</td>
</tr>
<tr>
<td>2</td>
<td>104</td>
<td>133</td>
</tr>
<tr>
<td>3</td>
<td>53</td>
<td>89</td>
</tr>
<tr>
<td>4</td>
<td>21</td>
<td>34</td>
</tr>
<tr>
<td>5</td>
<td>63</td>
<td>67</td>
</tr>
<tr>
<td>6</td>
<td>28</td>
<td>41</td>
</tr>
<tr>
<td>7</td>
<td>36</td>
<td>76</td>
</tr>
<tr>
<td>8</td>
<td>24</td>
<td>41</td>
</tr>
<tr>
<td>9</td>
<td>23</td>
<td>34</td>
</tr>
<tr>
<td>10</td>
<td>18</td>
<td>27</td>
</tr>
<tr>
<td>11</td>
<td>16</td>
<td>26</td>
</tr>
<tr>
<td>12</td>
<td>14</td>
<td>25</td>
</tr>
<tr>
<td>13</td>
<td>12</td>
<td>24</td>
</tr>
<tr>
<td>14</td>
<td>10</td>
<td>23</td>
</tr>
<tr>
<td>15</td>
<td>9</td>
<td>22</td>
</tr>
<tr>
<td>16</td>
<td>8</td>
<td>21</td>
</tr>
<tr>
<td>1</td>
<td>Fo</td>
<td>Fo</td>
</tr>
<tr>
<td>----</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td>3</td>
<td>112</td>
<td>94</td>
</tr>
<tr>
<td>4</td>
<td>336</td>
<td>251</td>
</tr>
<tr>
<td>5</td>
<td>263</td>
<td>251</td>
</tr>
<tr>
<td>6</td>
<td>232</td>
<td>221</td>
</tr>
<tr>
<td>7</td>
<td>230</td>
<td>193</td>
</tr>
<tr>
<td>8</td>
<td>136</td>
<td>112</td>
</tr>
<tr>
<td>9</td>
<td>196</td>
<td>121</td>
</tr>
<tr>
<td>10</td>
<td>146</td>
<td>124</td>
</tr>
<tr>
<td>11</td>
<td>75</td>
<td>67</td>
</tr>
<tr>
<td>12</td>
<td>116</td>
<td>74</td>
</tr>
<tr>
<td>13</td>
<td>53</td>
<td>53</td>
</tr>
</tbody>
</table>

651
711

<table>
<thead>
<tr>
<th>1</th>
<th>9</th>
<th>21</th>
<th>1</th>
<th>197</th>
<th>191</th>
<th>731</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>55</td>
<td>78</td>
<td>11</td>
<td>221</td>
<td>209</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>69</td>
<td>75</td>
<td>12</td>
<td>55</td>
<td>78</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>115</td>
<td>65</td>
<td>13</td>
<td>69</td>
<td>75</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>83</td>
<td>46</td>
<td>14</td>
<td>115</td>
<td>65</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>116</td>
<td>44</td>
<td></td>
<td></td>
<td></td>
<td>731</td>
</tr>
</tbody>
</table>

661

<table>
<thead>
<tr>
<th>0</th>
<th>80</th>
<th>103</th>
<th>0</th>
<th>80</th>
<th>103</th>
<th>741</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>19</td>
<td>51</td>
<td>1</td>
<td>19</td>
<td>51</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>73</td>
<td>86</td>
<td>2</td>
<td>73</td>
<td>86</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>-16</td>
<td>&lt;23</td>
<td>3</td>
<td>-16</td>
<td>&lt;23</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>-14</td>
<td>&lt;23</td>
<td>4</td>
<td>-14</td>
<td>&lt;23</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>-12</td>
<td>&lt;23</td>
<td>5</td>
<td>-12</td>
<td>&lt;23</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>-10</td>
<td>&lt;23</td>
<td>6</td>
<td>-10</td>
<td>&lt;23</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>-8</td>
<td>&lt;23</td>
<td>7</td>
<td>-8</td>
<td>&lt;23</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>-6</td>
<td>&lt;23</td>
<td>8</td>
<td>-6</td>
<td>&lt;23</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>-4</td>
<td>&lt;23</td>
<td>9</td>
<td>-4</td>
<td>&lt;23</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>-2</td>
<td>&lt;23</td>
<td>10</td>
<td>-2</td>
<td>&lt;23</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>-0</td>
<td>&lt;23</td>
<td>11</td>
<td>-0</td>
<td>&lt;23</td>
<td></td>
</tr>
</tbody>
</table>

721

<table>
<thead>
<tr>
<th>0</th>
<th>126</th>
<th>161</th>
<th>0</th>
<th>126</th>
<th>161</th>
<th>741</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>61</td>
<td>85</td>
<td>1</td>
<td>61</td>
<td>85</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>43</td>
<td>31</td>
<td>2</td>
<td>43</td>
<td>31</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>32</td>
<td>44</td>
<td>3</td>
<td>32</td>
<td>44</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>76</td>
<td>76</td>
<td>4</td>
<td>76</td>
<td>76</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>21</td>
<td>21</td>
<td>5</td>
<td>21</td>
<td>21</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>4.7</td>
<td>57</td>
<td>6</td>
<td>4.7</td>
<td>57</td>
<td></td>
</tr>
</tbody>
</table>

711

<table>
<thead>
<tr>
<th>0</th>
<th>167</th>
<th>155</th>
<th>0</th>
<th>167</th>
<th>155</th>
<th>741</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>5</td>
<td>&lt;23</td>
<td>7</td>
<td>5</td>
<td>&lt;23</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>-5</td>
<td>&lt;23</td>
<td>8</td>
<td>-5</td>
<td>&lt;23</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>-7</td>
<td>&lt;23</td>
<td>9</td>
<td>-7</td>
<td>&lt;23</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>-9</td>
<td>&lt;23</td>
<td>10</td>
<td>-9</td>
<td>&lt;23</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>-11</td>
<td>&lt;23</td>
<td>11</td>
<td>-11</td>
<td>&lt;23</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>-13</td>
<td>&lt;23</td>
<td>12</td>
<td>-13</td>
<td>&lt;23</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>-15</td>
<td>&lt;23</td>
<td>13</td>
<td>-15</td>
<td>&lt;23</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>-17</td>
<td>&lt;23</td>
<td>14</td>
<td>-17</td>
<td>&lt;23</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>-19</td>
<td>&lt;23</td>
<td>15</td>
<td>-19</td>
<td>&lt;23</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>-21</td>
<td>&lt;23</td>
<td>16</td>
<td>-21</td>
<td>&lt;23</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>-23</td>
<td>&lt;23</td>
<td>17</td>
<td>-23</td>
<td>&lt;23</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Fe</td>
<td>Fo</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>----</td>
<td>----</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>17</td>
<td>23</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>14</td>
<td>16</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>12</td>
<td>27</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>14</td>
<td>23</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>0</td>
<td>31</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>-28</td>
<td>71</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>-7</td>
<td>23</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>-26</td>
<td>34</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>-16</td>
<td>11</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>751</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>67</td>
<td>62</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>71</td>
<td>69</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>120</td>
<td>126</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>52</td>
<td>116</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>52</td>
<td>116</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>26</td>
<td>27</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>751</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>98</td>
<td>96</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>90</td>
<td>90</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>59</td>
<td>32</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>82</td>
<td>71</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>127</td>
<td>96</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>67</td>
<td>46</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>188</td>
<td>96</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>95</td>
<td>66</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>57</td>
<td>55</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>761</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>12</td>
<td>23</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>761</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>-75</td>
<td>62</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>51</td>
<td>11</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>36</td>
<td>11</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>-87</td>
<td>74</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>601</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>-106</td>
<td>74</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>133</td>
<td>251</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>262</td>
<td>379</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>109</td>
<td>233</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>-49</td>
<td>48</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>-103</td>
<td>50</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>-36</td>
<td>30</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>621</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>1</td>
<td>10</td>
<td>22</td>
<td>39</td>
<td>13</td>
<td>67</td>
<td>70</td>
</tr>
<tr>
<td>2</td>
<td>107</td>
<td>217</td>
<td>234</td>
<td>128</td>
<td>50</td>
<td>125</td>
</tr>
<tr>
<td>3</td>
<td>159</td>
<td>207</td>
<td>117</td>
<td>120</td>
<td>10</td>
<td>9</td>
</tr>
<tr>
<td>4</td>
<td>150</td>
<td>216</td>
<td>171</td>
<td>221</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>5</td>
<td>156</td>
<td>211</td>
<td>177</td>
<td>256</td>
<td>128</td>
<td>126</td>
</tr>
<tr>
<td>6</td>
<td>143</td>
<td>73</td>
<td>127</td>
<td>77</td>
<td>6</td>
<td>9</td>
</tr>
<tr>
<td>7</td>
<td>67</td>
<td>37</td>
<td>37</td>
<td>29</td>
<td>19</td>
<td>921</td>
</tr>
<tr>
<td>8</td>
<td>0</td>
<td>35</td>
<td>23</td>
<td>23</td>
<td>1</td>
<td>132</td>
</tr>
<tr>
<td>9</td>
<td>1</td>
<td>26</td>
<td>19</td>
<td>23</td>
<td>3</td>
<td>124</td>
</tr>
<tr>
<td>10</td>
<td>0</td>
<td>36</td>
<td>36</td>
<td>36</td>
<td>1</td>
<td>921</td>
</tr>
<tr>
<td>11</td>
<td>1</td>
<td>205</td>
<td>129</td>
<td>129</td>
<td>2</td>
<td>159</td>
</tr>
<tr>
<td>12</td>
<td>0</td>
<td>173</td>
<td>34</td>
<td>34</td>
<td>3</td>
<td>215</td>
</tr>
<tr>
<td>13</td>
<td>6</td>
<td>39</td>
<td>65</td>
<td>65</td>
<td>4</td>
<td>71</td>
</tr>
<tr>
<td>14</td>
<td>5</td>
<td>-18</td>
<td>63</td>
<td>63</td>
<td>5</td>
<td>15</td>
</tr>
<tr>
<td>15</td>
<td>9</td>
<td>-8</td>
<td>21</td>
<td>21</td>
<td>6</td>
<td>27</td>
</tr>
<tr>
<td>16</td>
<td>10</td>
<td>-25</td>
<td>23</td>
<td>23</td>
<td>7</td>
<td>46</td>
</tr>
<tr>
<td>17</td>
<td>11</td>
<td>-8</td>
<td>21</td>
<td>21</td>
<td>8</td>
<td>66</td>
</tr>
<tr>
<td>18</td>
<td>13</td>
<td>121</td>
<td>173</td>
<td>173</td>
<td>9</td>
<td>57</td>
</tr>
<tr>
<td>19</td>
<td>15</td>
<td>35</td>
<td>73</td>
<td>73</td>
<td>10</td>
<td>35</td>
</tr>
<tr>
<td>20</td>
<td>159</td>
<td>232</td>
<td>232</td>
<td>232</td>
<td>1</td>
<td>119</td>
</tr>
</tbody>
</table>

*Note: The above table represents a portion of a data table, likely from a scientific or mathematical context.*
<table>
<thead>
<tr>
<th></th>
<th>Fe</th>
<th>Fo</th>
<th></th>
<th>Fe</th>
<th>Fo</th>
<th></th>
<th>Fe</th>
<th>Fo</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>176</td>
<td>156</td>
<td>9</td>
<td>95</td>
<td>83</td>
</tr>
<tr>
<td>2</td>
<td>166</td>
<td>166</td>
<td>10</td>
<td>95</td>
<td>85</td>
<td>11</td>
<td>64</td>
<td>33</td>
</tr>
<tr>
<td>3</td>
<td>94</td>
<td>94</td>
<td>12</td>
<td>95</td>
<td>89</td>
<td>13</td>
<td>32</td>
<td>19</td>
</tr>
<tr>
<td>4</td>
<td>32</td>
<td>32</td>
<td>14</td>
<td>85</td>
<td>76</td>
<td>15</td>
<td>76</td>
<td>39</td>
</tr>
<tr>
<td>5</td>
<td>266</td>
<td>266</td>
<td>16</td>
<td>70</td>
<td>71</td>
<td>17</td>
<td>65</td>
<td>23</td>
</tr>
<tr>
<td>6</td>
<td>165</td>
<td>156</td>
<td>18</td>
<td>161</td>
<td>136</td>
<td>19</td>
<td>82</td>
<td>122</td>
</tr>
<tr>
<td>7</td>
<td>165</td>
<td>133</td>
<td>20</td>
<td>116</td>
<td>99</td>
<td>21</td>
<td>79</td>
<td>69</td>
</tr>
<tr>
<td>8</td>
<td>153</td>
<td>127</td>
<td>22</td>
<td>43</td>
<td>25</td>
<td>23</td>
<td>76</td>
<td>48</td>
</tr>
<tr>
<td>9</td>
<td>151</td>
<td>140</td>
<td>24</td>
<td>23</td>
<td>17</td>
<td>25</td>
<td>73</td>
<td>69</td>
</tr>
<tr>
<td>10</td>
<td>266</td>
<td>235</td>
<td>26</td>
<td>112</td>
<td>1 _ 26</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>174</td>
<td>154</td>
<td>28</td>
<td>162</td>
<td>161</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>56</td>
<td>31</td>
<td>30</td>
<td>163</td>
<td>212</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>9</td>
<td>11</td>
<td>32</td>
<td>163</td>
<td>212</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>165</td>
<td>133</td>
<td>34</td>
<td>116</td>
<td>122</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>153</td>
<td>127</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>151</td>
<td>140</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>266</td>
<td>235</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>174</td>
<td>154</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>56</td>
<td>31</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>9</td>
<td>11</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>165</td>
<td>133</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>153</td>
<td>127</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>151</td>
<td>140</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>266</td>
<td>235</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>174</td>
<td>154</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>56</td>
<td>31</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>9</td>
<td>11</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>165</td>
<td>133</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>153</td>
<td>127</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>151</td>
<td>140</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>266</td>
<td>235</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>32</td>
<td>174</td>
<td>154</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>33</td>
<td>56</td>
<td>31</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>34</td>
<td>9</td>
<td>11</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>35</td>
<td>165</td>
<td>133</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>36</td>
<td>153</td>
<td>127</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>37</td>
<td>151</td>
<td>140</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>38</td>
<td>266</td>
<td>235</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>39</td>
<td>174</td>
<td>154</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>56</td>
<td>31</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>41</td>
<td>9</td>
<td>11</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>42</td>
<td>165</td>
<td>133</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>43</td>
<td>153</td>
<td>127</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>44</td>
<td>151</td>
<td>140</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>45</td>
<td>266</td>
<td>235</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>46</td>
<td>174</td>
<td>154</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>47</td>
<td>56</td>
<td>31</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>48</td>
<td>9</td>
<td>11</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>49</td>
<td>165</td>
<td>133</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>50</td>
<td>153</td>
<td>127</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>51</td>
<td>151</td>
<td>140</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>52</td>
<td>266</td>
<td>235</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>53</td>
<td>174</td>
<td>154</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>54</td>
<td>56</td>
<td>31</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>55</td>
<td>9</td>
<td>11</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>56</td>
<td>165</td>
<td>133</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>57</td>
<td>153</td>
<td>127</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>58</td>
<td>151</td>
<td>140</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>59</td>
<td>266</td>
<td>235</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>60</td>
<td>174</td>
<td>154</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>61</td>
<td>56</td>
<td>31</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>62</td>
<td>9</td>
<td>11</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>63</td>
<td>165</td>
<td>133</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>64</td>
<td>153</td>
<td>127</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>65</td>
<td>151</td>
<td>140</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>66</td>
<td>266</td>
<td>235</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>67</td>
<td>174</td>
<td>154</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>68</td>
<td>56</td>
<td>31</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>69</td>
<td>9</td>
<td>11</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>70</td>
<td>165</td>
<td>133</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>71</td>
<td>153</td>
<td>127</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>72</td>
<td>151</td>
<td>140</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>73</td>
<td>266</td>
<td>235</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>74</td>
<td>174</td>
<td>154</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>75</td>
<td>56</td>
<td>31</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>76</td>
<td>9</td>
<td>11</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>77</td>
<td>165</td>
<td>133</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>78</td>
<td>153</td>
<td>127</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>79</td>
<td>151</td>
<td>140</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>80</td>
<td>266</td>
<td>235</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>81</td>
<td>174</td>
<td>154</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>82</td>
<td>56</td>
<td>31</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>83</td>
<td>9</td>
<td>11</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>84</td>
<td>165</td>
<td>133</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>85</td>
<td>153</td>
<td>127</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>86</td>
<td>151</td>
<td>140</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>87</td>
<td>266</td>
<td>235</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>88</td>
<td>174</td>
<td>154</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>89</td>
<td>56</td>
<td>31</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>90</td>
<td>9</td>
<td>11</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>91</td>
<td>165</td>
<td>133</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>92</td>
<td>153</td>
<td>127</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>93</td>
<td>151</td>
<td>140</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>94</td>
<td>266</td>
<td>235</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>95</td>
<td>174</td>
<td>154</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>96</td>
<td>56</td>
<td>31</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>97</td>
<td>9</td>
<td>11</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>98</td>
<td>165</td>
<td>133</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>99</td>
<td>153</td>
<td>127</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>100</td>
<td>151</td>
<td>140</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>101</td>
<td>266</td>
<td>235</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>102</td>
<td>174</td>
<td>154</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>103</td>
<td>56</td>
<td>31</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>104</td>
<td>9</td>
<td>11</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>105</td>
<td>165</td>
<td>133</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>106</td>
<td>153</td>
<td>127</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>107</td>
<td>151</td>
<td>140</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>108</td>
<td>266</td>
<td>235</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>109</td>
<td>174</td>
<td>154</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>110</td>
<td>56</td>
<td>31</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>111</td>
<td>9</td>
<td>11</td>
<td>1111</td>
<td>1231</td>
<td>1311</td>
<td>1411</td>
<td>1511</td>
<td>1611</td>
</tr>
<tr>
<td>0</td>
<td>131</td>
<td>133</td>
<td>1</td>
<td>107</td>
<td>92</td>
<td>10</td>
<td>77</td>
<td>89</td>
</tr>
<tr>
<td>1</td>
<td>149</td>
<td>136</td>
<td>11</td>
<td>34</td>
<td>23</td>
<td>11</td>
<td>32</td>
<td>39</td>
</tr>
<tr>
<td>2</td>
<td>116</td>
<td>110</td>
<td>12</td>
<td>25</td>
<td>40</td>
<td>12</td>
<td>25</td>
<td>40</td>
</tr>
<tr>
<td>3</td>
<td>163</td>
<td>152</td>
<td>13</td>
<td>91</td>
<td>85</td>
<td>13</td>
<td>76</td>
<td>48</td>
</tr>
<tr>
<td>4</td>
<td>55</td>
<td>46</td>
<td>14</td>
<td>53</td>
<td>35</td>
<td>14</td>
<td>53</td>
<td>35</td>
</tr>
<tr>
<td>5</td>
<td>0</td>
<td>4</td>
<td>15</td>
<td>107</td>
<td>92</td>
<td>15</td>
<td>107</td>
<td>92</td>
</tr>
<tr>
<td>6</td>
<td>111</td>
<td>127</td>
<td>16</td>
<td>150</td>
<td>170</td>
<td>16</td>
<td>150</td>
<td>170</td>
</tr>
<tr>
<td>7</td>
<td>134</td>
<td>131</td>
<td>17</td>
<td>94</td>
<td>73</td>
<td>17</td>
<td>94</td>
<td>73</td>
</tr>
<tr>
<td>8</td>
<td>198</td>
<td>165</td>
<td>18</td>
<td>53</td>
<td>59</td>
<td>18</td>
<td>53</td>
<td>59</td>
</tr>
<tr>
<td>9</td>
<td>72</td>
<td>68</td>
<td>19</td>
<td>98</td>
<td>73</td>
<td>19</td>
<td>98</td>
<td>73</td>
</tr>
<tr>
<td></td>
<td>Fe</td>
<td>Fe</td>
<td></td>
<td>Fo</td>
<td>Fo</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>------</td>
<td>------</td>
<td>---</td>
<td>------</td>
<td>------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>52</td>
<td>&lt; 16</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>17</td>
<td>19</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>19</td>
<td>19</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>142</td>
<td>&lt; 16</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>16</td>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>42</td>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>21</td>
<td>12</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>15</td>
<td>&lt; 7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Table 1:**

<table>
<thead>
<tr>
<th></th>
<th>19</th>
<th>42</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>120</td>
<td>133</td>
</tr>
<tr>
<td>2</td>
<td>43</td>
<td>69</td>
</tr>
<tr>
<td>3</td>
<td>89</td>
<td>126</td>
</tr>
<tr>
<td>4</td>
<td>133</td>
<td>251</td>
</tr>
<tr>
<td>5</td>
<td>36</td>
<td>55</td>
</tr>
<tr>
<td>6</td>
<td>45</td>
<td>67</td>
</tr>
<tr>
<td>7</td>
<td>51</td>
<td>68</td>
</tr>
<tr>
<td>8</td>
<td>123</td>
<td>177</td>
</tr>
<tr>
<td>9</td>
<td>31</td>
<td>69</td>
</tr>
<tr>
<td>10</td>
<td>41</td>
<td>58</td>
</tr>
</tbody>
</table>

**Table 2:**

<table>
<thead>
<tr>
<th></th>
<th>27</th>
<th>&lt; 7</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>19</td>
<td>42</td>
</tr>
<tr>
<td>2</td>
<td>82</td>
<td>24</td>
</tr>
<tr>
<td>3</td>
<td>120</td>
<td>133</td>
</tr>
<tr>
<td>4</td>
<td>43</td>
<td>69</td>
</tr>
<tr>
<td>5</td>
<td>89</td>
<td>126</td>
</tr>
<tr>
<td>6</td>
<td>133</td>
<td>251</td>
</tr>
<tr>
<td>7</td>
<td>36</td>
<td>55</td>
</tr>
<tr>
<td>8</td>
<td>45</td>
<td>67</td>
</tr>
<tr>
<td>9</td>
<td>51</td>
<td>68</td>
</tr>
<tr>
<td>10</td>
<td>123</td>
<td>177</td>
</tr>
</tbody>
</table>

**Table 3:**

<table>
<thead>
<tr>
<th></th>
<th>11</th>
<th>16</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>23</td>
<td>39</td>
</tr>
</tbody>
</table>

**Table 4:**

<table>
<thead>
<tr>
<th></th>
<th>120</th>
<th>133</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>41</td>
<td>69</td>
</tr>
<tr>
<td>2</td>
<td>32</td>
<td>60</td>
</tr>
<tr>
<td>3</td>
<td>42</td>
<td>60</td>
</tr>
<tr>
<td>4</td>
<td>89</td>
<td>126</td>
</tr>
<tr>
<td>5</td>
<td>133</td>
<td>251</td>
</tr>
<tr>
<td>6</td>
<td>36</td>
<td>55</td>
</tr>
<tr>
<td>7</td>
<td>45</td>
<td>67</td>
</tr>
<tr>
<td>8</td>
<td>51</td>
<td>68</td>
</tr>
<tr>
<td>9</td>
<td>123</td>
<td>177</td>
</tr>
</tbody>
</table>

**Table 5:**

<table>
<thead>
<tr>
<th></th>
<th>112</th>
<th>119</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>84</td>
<td>96</td>
</tr>
<tr>
<td>2</td>
<td>120</td>
<td>133</td>
</tr>
<tr>
<td>3</td>
<td>32</td>
<td>25</td>
</tr>
<tr>
<td>4</td>
<td>39</td>
<td>27</td>
</tr>
<tr>
<td>5</td>
<td>175</td>
<td>165</td>
</tr>
<tr>
<td>6</td>
<td>1C1</td>
<td>168</td>
</tr>
<tr>
<td>7</td>
<td>97</td>
<td>69</td>
</tr>
<tr>
<td>8</td>
<td>86</td>
<td>51</td>
</tr>
<tr>
<td>9</td>
<td>27</td>
<td>27</td>
</tr>
</tbody>
</table>

**Table 6:**

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>63</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>-78</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>5</td>
<td>16</td>
</tr>
</tbody>
</table>
Figure 1. Patterson Projection of Zinc 8-Hydroxyquinolinate Dihydrate Upon (010). Compare With Figures 2 and 3. Crosses Indicate Final Positions of Atom Centers. Contour lines at arbitrary intervals, zero contour dotted, contours around origin at 4x value of others.
Figure 3. Structure of Zinc 5-Hydroxyquinolinate Dihydrate as Seen Projected upon (010). Actual Interatomic Distances Indicated in Angstrom Units.
Figure 4. Schematic Representation of Bonds Around Central Zinc Atom in Zinc 8-Hydroxyquinolinate Dihydrate.