Gases evolving from the brass walls of the container resulted in gradually decreasing charging, which could be returned to the original value by pumping for several hours at 1×10^{-5} mm of mercury. These results indicate that this type of tribo-electric charging strongly depends on the gas layers adhering to the surfaces involved. The amorphous quartz particles might be expected, because of the differences in structure, to acquire charge in friction with crystalline quartz. Actually, however, there was greater charging when the amorphous quartz particles struck the amorphous quartz receiving bucket, which further substantiates the belief that so-called "tribo-electric" series have little meaning.

Since the piezo-electric contribution to the charging of the sand amounted to less than 20 percent of its total charge, when the crystal was strained by a force of nearly 5×10^{6} dynes, it seems evident that the piezo-electric effect is not an important factor in tribo-electrification.

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The K-Shell Internal Conversion Coefficients*

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THE purpose of this letter is to report the fact that numerical calculation of the K-shell internal conversion coefficients has been carried out and to describe the results briefly. These calculations were carried out using relativistic (Dirac) wave functions for the Coulomb field, for the following parameters: $10\leq Z\leq 96$ (comprising 23 values of Z); $0.3\leq k\leq 5.0$ (for $Z\leq 78$, 16 values of k) and $0.5\leq k\leq 5.0$ (for $Z>78$, 14 values of k), where $k\,mc^2$ is the gamma-ray energy, and for both electric and magnetic multipoles of order 2^l with $1\leq l\leq 5$. The domain of computation in the $Z-k$ plane is indicated in Fig. 1. A total of 680 values of the conversion coefficient have been obtained on the automatic sequence relay calculator (Mark I) at Harvard University (for 12 values of Z and 5 to 6 values of k) and 2560 additional values were obtained by interpolation. The values obtained on the Mark I are given to four significant figures and the interpolated values are given to three. While extensive tables have been prepared, space limitations prevent their inclusion here.[1] It is planned to present these results in a subsequent publication in which they would appear in the form of families of curves to be given for essentially all values of Z throughout the periodic table. In addition, internal conversion coefficients for all three sub-shells of the L-shell will then be presented for $10k$ values, 10 multipoles and all Z values. These results which include the effect of screening will be supplemented by low energy K-shell coefficients computed in the same manner, i.e., with screening.

In Fig. 1 the contour lines for the electric dipole and 2^5 pole (α_1 and α_5)[2] give an indication of the numerical results. Comparison with the approximate calculations of Hebb and Uhlenbeck[3] (non-relativistic, electric multipoles), of Drell[4] ("non-relativistic," magnetic multipoles) and of Dancoff and Morrison[5] (Born approximation) shows that these approximations give reliable results in a much more restricted range of Z and k than had been previously thought to be applicable. Their application, even in the range $Z<50$, can lead to an error of a factor 3 or more (especially in the case of higher order multipoles and magnetic conversion) and in many cases the error is such as to lead to an incorrect assignment of multipole order.[6]

Comparison was also made with the relativistic calculations of Hulme[7] (α_1; $Z=84$), Taylor and Mott[8] (α_2; $Z=84$), Fisk and Taylor[9] (β_1, β_2, β_3; $Z=84$) and Griffith and Stanley[10] (α_1; $Z=69$ (5) 89). In all cases, except for α_2 where the results of Taylor and Mott differ slightly, there was agreement within the mutual precision of the calculations (of order 3 percent). The neglect of screening, which is the only significant effect omitted in these calculations, is *a posteriori* justified by comparison with the results of Reitz[11] who has computed the low energy K-shell coefficients, taking screening into account with a Thomas-Fermi-Dirac field, in the cases α_1, α_2, and β_1 for $Z=29$, 49, 84, and 92. In the region of k for which our calculations overlap those of Reitz the screened results exceed our unscreened values by at most 10 percent (where screening would be expected to be most serious) and in the large majority of cases by an amount which is less than 3 percent. The $Z-k$ values for which Reitz's calculations were made are shown in Fig. 1 by the vertical lines marked R. The dashed curves for $k<0.3$ are rough extrapolations for α_1 using Reitz's results and the approximation values for $Z<10$.

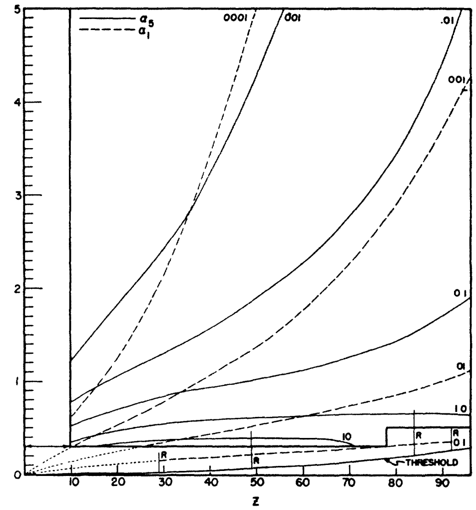

FIG. 1. The heavy lines ($Z\geq10$, $k\geq0.3$, 0.5) show the domain of calculation. Contour lines for electric dipole (α_1) and electric 2^5 pole (α_5) are also shown with values of the internal conversion coefficients affixed to the curves and α_1 has been extrapolated to low k. The lines marked R show where Reitz's calculations were made.

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1 Some copies of these tables have been circulated prior to publication. Requests should be addressed to the first-named author.
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The Disintegration of In^{114}

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THE 50-day activity of In^{114} was investigated some years ago by Lawson and Cork[1] who found that the 50-day isomer decays to a 72-second isomeric state, under the emission of a highly internally converted gamma-ray of energy 0.192 Mev. The state of In^{114} of 72-sec. half-life then decays to the ground state of Sn^{114} with the emission of a beta-ray whose end point