On the basis of all stars analyzed we find the following alpha to proton ratios: O—2.1, Ne—1.4, A—0.9, Kr—0.21.

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Beta-Gamma Angular Correlation in the Decay of I^{126} and K^{42}

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WE have measured the beta-gamma angular correlation in the decay of I^{126} and of K^{42}. The apparatus used and the treatment of the data have been described in a previous paper.[1]

I^{126} was prepared in the MIT cyclotron by a $(d,2n)$ reaction on enriched Te^{126}.[2] The iodine was separated from the tellurium by distillation from nitric acid. Any short-lived iodine isotopes were allowed to decay before the beginning of the experiments. It was assumed that the 8-day I^{131} present was negligible since the target material contained only very small amounts of Te^{130}. Thin sources were prepared by drying a drop of radioactive NaI solution in an atmosphere of nitrogen. The average thickness of the sources used was less than $\frac{1}{2}$ mg/cm^2. Some loss of source activity was noted during the experiment which presumably resulted from oxidation of iodide to free iodine. Sources were changed and the spectrometer decontaminated frequently to reduce errors introduced by this phenomenon. Figure 1 shows the observed anisotropy of the beta-gamma coincidence rate, $E(180°)$, as a function of beta-ray energy. E is the excess of the coincidence rate at 180° over that at 90°, corrected for the finite resolution of the apparatus as described in reference 1.

K^{42} was obtained by neutron irradiation of potassium in the Brookhaven reactor.[2] Sources were prepared by evaporation of active KCl in vacuum, and were less than 2 mg/cm^2 thick. The anisotropy found for beta-rays of 1.23 Mev was $E=-0.055\pm0.024$, and at 1.55 Mev $E=-0.065\pm0.023$. These results are not incompatible with that of Beyster and Wiedenbeck[3] who reported an integral anisotropy of about -0.07.

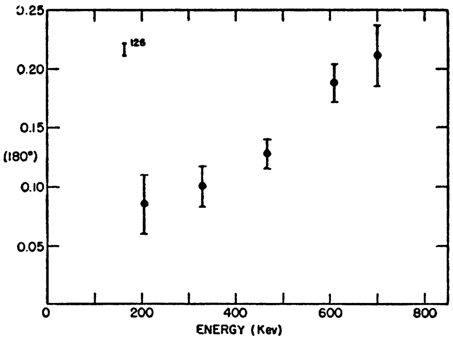

FIG. 1. Beta-gamma angular correlation of I^{126} as a function of beta-ray energy.

The decay schemes of Rb^{86}, I^{126}, and K^{42} are very similar.[4] The shapes of the high energy spectra all indicate $\Delta J=2$, yes, with the single matrix element B_{ij} of the tensor or the axial vector interaction. Since the even-even ground states are probably $J=0$, even, the beta-active states must be $J=2$, odd. The low energy beta-spectra of Rb^{86} and I^{126} which give rise to the observed coincidences have very nearly allowed shapes.[5,6] Fuchs[7] has been able to fit both the spectrum shape and our results[1] on the angular correlation of Rb^{86} by assuming $J=2$, even, for the excited state of Sr^{86} and a combination of tensor interaction matrix elements B_{ij} and $\int\beta\alpha$ for the low energy spectrum. The great similarity of the angular correlation in I^{126} (Fig. 1) to that of Rb^{86} makes it appear probable that the same terms will explain both decays. The shape of the low energy spectrum of K^{42} is not known. In view of the lower atomic number and higher beta-energy the observed angular correlation may be consistent with a transition of the same type as Rb^{86} and I^{126}.

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