crystals can be lapped to flatnesses of the order of three rings of sodium light. Though this is difficult to obtain with small, thin crystals, the thinness of the crystal and its soft surface permit a satisfactory seal when it is clamped to the metal body. Seals of this type were found to hold $CS_2$ for several hours without any perceptible signs of leakage.


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## Electromagnetic Enrichment of $Fe^{58}$ Content and Concurrent Impoverishment of $Fe^{54}$ Content in Iron[1]


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The radioactive isotope $Fe^{59}$ (half-life = 47 days) is important in physiological studies. It can be produced in the thermal neutron reactor by the following reaction: $Fe^{58}$ (n, $\gamma$) $Fe^{59}$. The $Fe^{54}$ content of the iron being irradiated must be low to minimize the formation of $Fe^{55}$ (half-life = 4 years) by the reaction: $Fe^{54}$ (n, $\gamma$) $Fe^{55}$.

TABLE 1

ABUNDANCE OF FE ISOTOPES IN IRON ENRICHED IN $Fe^{58}$

| | (a) Shipment No. 1 | (b) Shipment No. 2 | (c) Best collection | (d) Natural abundance |
|---|---|---|---|---|
| | % | % | % | % |
| $Fe^{54}$ ..... | 0.8 | 0.6 | 0.3 | 5.81 |
| $Fe^{56}$ ..... | 50.4 | 21.0 | 12.3 | 91.64 |
| $Fe^{57}$ ..... | 6.9 | 2.7 | 1.4 | 2.21 |
| $Fe^{58}$ ..... | 42.0 | 75.7 | 86.0 | 0.34 |
| $Fe^{58}/Fe^{54}$ ratio | 53 | 126 | 287 | 0.06 |

The normal abundances of $Fe^{58}$ (0.34%) (*1*) and of $Fe^{54}$ (5.81%) (*1*) and the neutron cross sections of $Fe^{58}$ (0.36 barn) (*2*) and of $Fe^{54}$ (2.5 barns) (*2*) favor the formation of the long-lived $Fe^{55}$ when normal iron is irradiated by neutrons. Iron enriched in $Fe^{58}$ and impoverished in $Fe^{54}$ has been produced electromagnetically in the calutrons at the Y-12 Research Laboratory. Table 1 summarizes mass analyses of three representative $Fe^{58}$ collections. Columns (a) and (b) are the analyses of two shipments of $Fe^{58}$ that have been used for the production of $Fe^{59}$ low in $Fe^{55}$ by neutron irradiation. Column (c) summarizes the best collection of $Fe^{58}$ to date and is illustrative of the quality that can be obtained.

The accomplishments reported here are the combined efforts of the professional and operational personnel performing calutron operations and associated chemistry. Particular credit is due L. O. Love, W. A. Bell, E. H. Swanson, S. F. Fairbourne, and L. O. Gilpatrick. The mass analyses of the enriched isotopes were done under the direction of R. F. Hibbs.

[1] This report is based on research carried out under contract for the Atomic Energy Commission by the Isotope Research and Production Division at the Carbide and Carbon Chemicals Corporation, Y-12 Research Laboratory, Oak Ridge, Tennessee.


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## The Eosinophil Response: Immediate vs. Delayed Eosinopenia[1]


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With the growing interest in physiology of the adrenal cortex, the eosinophil response has become an important criterion of adrenal cortical discharge. In fact, it is reputed to be the most sensitive indicator of release of C-11 type steroids from a functioning adrenal cortex. In man the administration of either adrenocorticotropic hormone (ACTH) (*2, 7*), Compound E (*3, 5*), or epinephrine (*4, 6*) produces an eosinopenic response which occurs gradually, reaching its maximum in 3–4 hr. The fate of the disappearing eosinophils remains an unsolved mystery.

In this study, the eosinophil response to epinephrine and histamine was observed in a series of unanesthetized, trained dogs. Dunger's method was employed in counting the circulating eosinophils (*1*). All drugs were injected intravenously. Histamine and epinephrine[3] solutions were infused at a constant rate over a 60-min period. Two control counts were done on each animal prior to administration of any drug. If variation in the two counts exceeded 10%, a third count was made and the average taken as the base line. Statistical analysis of a series of hourly counts on eight dogs in control experiments revealed a mean coefficient of variation of 5.6%, with a range of 3.2%–13.5%. Changes in counts were recorded as percent deviations from the control counts.


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[3] Epinephrine used was obtained through the kindness of Dr. E. A. Sharp of Parke-Davis & Co.