

a rare earth element from many tons of a neighboring rare earth element, so these cases were eliminated from further consideration. After these restrictions were imposed, the number of suitable (ν, e^-) reactions was extremely limited, and with one exception, were the ones already discussed in the literature. The reactions selected are summarized in Table IV. In this table is listed the calculated neutrino capture rate from Dr. Bahcall's paper, and the number of tons of the element required for one capture per day.

One must then select from this short list of possibilities, the most suitable reaction. The major considerations are, the availability of the target element, and the sensitivity of counting the radioactive product. One has confidence that an efficient chemical separation technique can be developed.

The Rb^{87} reaction, that was suggested by Goldhaber,¹⁶ takes advantage of the isomeric state in Sr^{87} . This reaction has the lowest threshold of those listed. The chemical separation of strontium from an aqueous solution of a rubidium salt could be readily accomplished with a chelating resin. A rapid chemical separation is required, since the half-life of Sr^{87m} is only 2.8 hours. In fact a chemical processing system would have to be used that would remove a sample every three hours or so. The counting of the 388 keV gamma (or its conversion electron) from Sr^{87m} decay could be accomplished with a silicon or germanium detector to achieve high resolution. Rubidium is a rare and expensive element, but ton quantities may be obtained.

The very attractive reaction $Ga^{71}(\nu, e^-)Ge^{71}$ has been discussed by several authors,¹⁷ and by Professor Zatsepin at this conference. The main difficulty again is the very high cost and availability of ton quantities of gallium. The chemical separation can certainly be accomplished in an aqueous solution.