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Solar Neutrinos: II. Experimental*

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The prospect of observing solar neutrinos by means of the inverse beta process $\text{Cl}^{37}(\nu, e^-)\text{Ar}^{37}$ induced us to place the apparatus previously described¹ in a mine and make a preliminary search. This experiment served to place an upper limit on the flux of extraterrestrial neutrinos. These results will be reported, and a discussion will be given of the possibility of extending the sensitivity of the method to a degree capable of measuring the solar neutrino flux calculated by Bahcall in the preceding paper.²

The apparatus consists of two 500-gallon tanks of perchlorethylene, C_2Cl_4 , equipped with agitators and an auxiliary system for purging with helium. It is located in a limestone mine 2300 feet below the surface³ (1800 meters of water equivalent shielding, m.w.e.). Initially the tanks were swept completely free of air argon by purging the tanks with a stream of helium gas. Ar^{36} carrier (0.10 cm^3) was introduced and the tanks exposed for periods of four months or more to allow the 35-d Ar^{37} activity to reach nearly the saturation value. Carrier argon along with any Ar^{37} produced were removed from the tanks by sweeping them in series with 5000 liters of helium. Argon was extracted from the helium gas stream with activated charcoal at 78°K . Finally the argon was desorbed from the charcoal, purified and counted. The overall efficiency of the processing was determined by Ar^{36} isotopic analysis

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