linear amplifier, the pulses from the counters were fed into the deflectors vertical and horizontal respectively, of a Braun-tube oscilloscope, in order to discriminate a spurious pulse due to an accidental electromagnetic induction from the accelerating tube. The output from the Be-counter were also recorded on the printing paper by an electromagnetic oscillograph.

When these counters were irradiated by the γ-rays, many pulses were observed in the Be-counter, but very few in the uncoated counter. Moreover, the number of observed kicks from the Be-counter was seen to follow exactly the γ-ray excitation curves. These facts show that the observed pulses from the Be-counter were definitely due to some processes in Be produced by the γ-rays, but not by the contaminated neutrons. The oscillograph records were analysed and the following disintegration schema were concluded.

1) $Be^9 + 17.6\,Mev\,\gamma \rightarrow Be^{8*} + n$ $Be^{8*} \rightarrow 2\alpha$ Be^{8*} in 7 Mev excited state.
2) $Be^9 + 17.6\,Mev\,\gamma \rightarrow Be^8 + n$ $Be^8 \rightarrow 2\alpha$ Be^8 in ground state.
3) $Be^9 + 6.13\,Mev\,\gamma \rightarrow Be^8 + n$ $Be^8 \rightarrow 2\alpha$

The cross-sections for these three processes were found to be

1) $2.15 \times 10^{-27}\,cm^2$
2) $5.1 \times 10^{-26}\,cm^2$
3) $1.62 \times 10^{-27}\,cm^2$

respectively.

The trend of the excitation curve is entirely different from the theory of E. Guth[1]. Moreover, it seems noticeable that the excited states of Be^{8*} of energy 3.0 Mev and 4.8 Mev do not contribute in these processes.

More decisive experiments using photographic emulsion are now in progress.

1) E. Guth and C. Mullin, Phys. Rev., **76**, 234 (1949)

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7. Some Experiments on P^{32}.
I. Physical Procedures and Measurements.

Sakae Shimizu, Yoshiaki Uemura, Ryutaro Ishiwari,
Osamu Horibe and *Sunao Okamoto.*

We have produced radioactive phosphorus, P^{32}, by the reaction $S^{32}(n, p)P^{32}$. The irradiation of 3.8 liters of CS_2 in a spherical flask with a 50 mg. radium-beryllium neutron source placed at the center of the flask, during about 28 days produced sufficient P^{32} with a high activity sufficient to support some research programs. The extraction procedures of P^{32} from the irradiated CS_2 are described in Part II. The activity of P^{32} obtained was measured by an endwindow (2π-type) G-M counter with a thin mica window (4 mg/cm^2). The pulses from the counter were counted by a decade scaler particularly devised for the present experiment.

From the measurements, under various geometrical conditions, of activity of P^{32} contained in the sodium phosphate solution produced from the irradiated CS_2 as described in Part II, we found that the amount of P^{32} obtained may be about 1/15 μc.

The improvement of absolute yield of P^{32} and some physical studies are now in progress.

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8. Some Experiments on P^{32}.

II. Chemical Procedure.

Senji Utzino, Syuzo Akashi, Minoru Fukuda,
Hiroaki Akagi and *Tetsuya Hanai.*

The radioactive phosphorus P^{32} was prepared through irradiation of CS_2 by means of radium–berillium neutron source. The nuclear reaction induced by the neutron bombardment is $S^{32}(n, p)P^{32}$. The chemical separation work of radioactive phosphate from irradiated CS_2 was conducted in the following manner.

1. Extraction of P^{32} from CS_2 as radioactive phosphoric acid, using nitric acid as oxidant and iodine as catalyser. —Into 7 l. bottle with a glass–jointed reflux condenser are transferred 3.8 l. of irradiated CS_2 and as much as 1/3 volume of CS_2 nitric acid having the same specific gravity as that of CS_2. The mixture is added with a small piece of iodine and bubbled 3 hours through aeration and then after the addition of small amount of water the supernatant nitric acid is separated by a separating funnel from CS_2

2. Isolation of P^{32}–H_3PO_4 with carrier phosphate. —The separated nitric acid is distrilled in 1 l. retort until the residual volume becomes 2~3 c.c. After the residue is transferred to a 50 c.c. test tube and 0.3 m mol of KH_2PO_4 is added as carrier, the total phosphoric acid is precipitated by the addition of molybdic reagent as ammonium phosphomolybdate. This precipitate after being washed by ammonium nitrate solution is dissolved in ammonia and the phosphoric acid is reprecipitated as ammonium magnesium phosphate by the addition of magnesia mixture. The magnesium salt is washed several times with ammonia.

Conversion of insoluble ammonium magnesium phosphate into soluble sodium phosphate. —The magnesium salt is treated with stoichiometric quantities of sodium hydroxide with which it is allowed to react in a boiling water bath. The magnesium salt goes into solution as sodium phosphate and is separated from residual magnesia. The filtrate and washings of the insoluble magnesia are collected in a small casserol and adjusted to pH 7.2 with 0.1 n hydrochloric acid. The solution is evaporated to a small volume, filtered into a measured tube and the filtrate together with wshings is filled up to 5 c.c. The latter fluid being reserved as stock solution. The stock