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RADIATION LABORATORY

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UNIVERSITY OF CALIFORNIA

Radiation Laboratory

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SUMMARY OF THE RESEARCH PROGRESS MEETING OF MAY 1, 1952

Bonnie E. Cushman

May 7, 1952

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Berkeley, California

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I. Report on a Visit to the Brookhaven Cosmotron. William Brobeck

The magnet and radiofrequency system used in the Brookhaven proton synchrotron and efforts to maintain the beam were discussed. At present the beam lasts 30 - 40 msec. and then disappears for some unknown reason. The energy reached is about 30 Mev while the planned characteristics are 2.5 Bev and a pulse length of 1 sec. A resonance between a harmonic of the ripple in the magnet voltage and the phase oscillation is suspected and will be checked by putting an equal and opposite ripple through the pole face winding. The reproducibility of the pulses is not yet very good.

The Brookhaven work indicates that the smaller Bevatron gap planned will be adequate to handle the beam since the ratio of this gap to the magnet radius is the same as that of the cosmotron.

II. Recent Work on the Isotopes of Emanation. Earl Hyde

The low mass isotopes of emanation and francium have been studied to see if they show the same discontinuity in alpha decay characteristics when the 126 neutron shell is crossed as do astatine and polonium. The isotopes and decay properties are illustrated schematically in Fig. 1. Recent development of a technique for fixing the emanation atoms on a platinum plate made the determination of the emanation alpha decay energies much easier than in earlier studies. The method consists essentially of passing the gaseous activity through a glow discharge and

accelerating the ions formed onto a platinum plate at a potential of 400 - 800 V. The plate which is then put in a pulse analyzer to obtain the alpha spectrum, contains about 5 - 10 percent of the emanation activity. A plot of the emanation alpha decay energies against the number of neutrons in the isotopes is very similar to corresponding plots for astatine and polonium. The 126 neutron isotope is always the lowest point on the curve. See UCRL-1734 for more detailed information.

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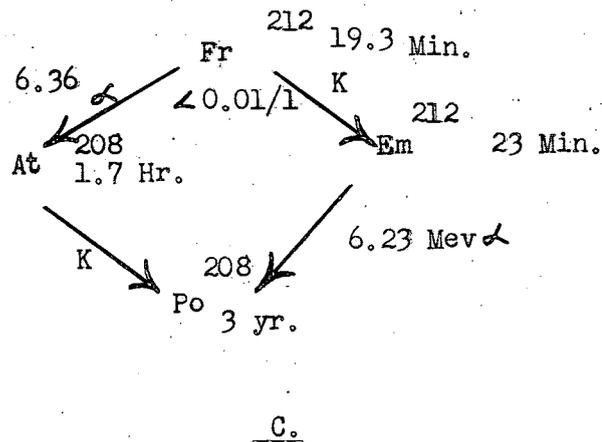
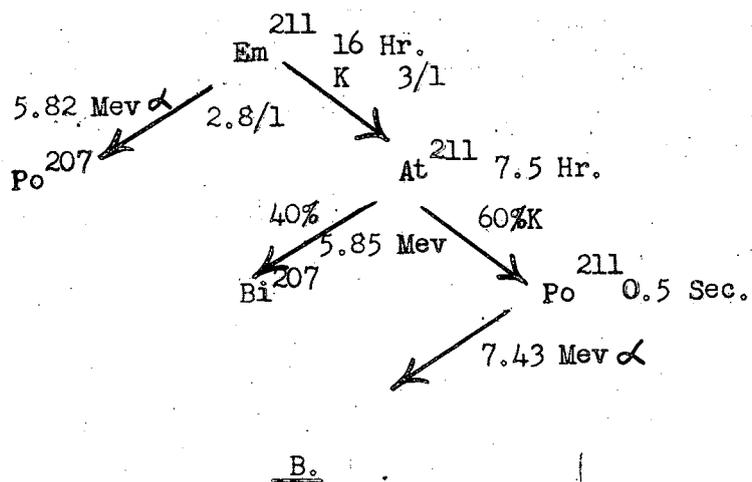
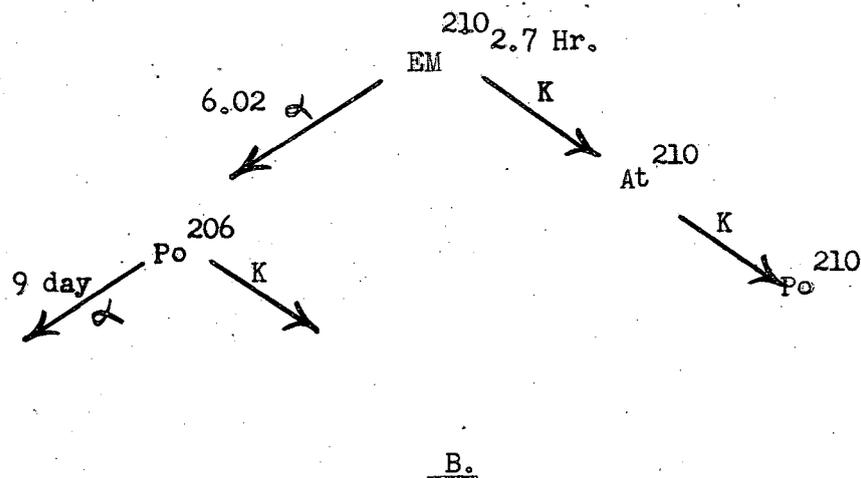
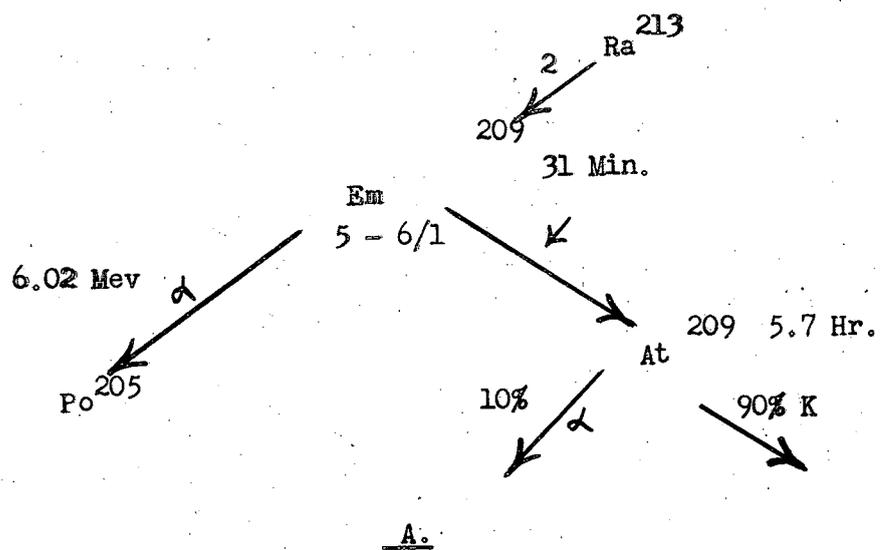


Fig. 1