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SUMMARY OF THE RESEARCH PROGRESS MEETINGS
OF AUGUST 21 AND 28, AND SEPTEMBER 11, 1952

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November 11, 1952

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Berkeley, California

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Radiation Laboratory, Department of Physics
University of California, Berkeley, California

November 11, 1952

Meeting of August 21, 1952

I. Thermal Conductivity of Gases at Moderate Pressures. L. Bromley.

The talk was based on a report UCRL-1852 of the same title by L. Bromely, dated June 12, 1952. The abstract is quoted as follows:

"An equation (eq. 15) is developed from theory and experimental data to enable one to calculate the group, $k/\eta C_v$. From this one may calculate the conductivity k if the viscosity η and constant volume heat capacity C_v may be calculated or estimated. Literature data are tabulated for $k, \eta, C_v, \gamma = C_p/C_v$ and $k/\eta C_v$. The average deviation between calculated (from eq. 15) and experimental values of $k/\eta C_v$ for 186 points on 48 different gases is ± 4 percent. The maximum deviation is 15 percent."

II. The Ten-Man Belgian Mission. Maurice D'Hont.

Dr. Maurice D'Hont of the Societ  de Metallique of Belgium has been visiting UCRL as a member of the committee sent by the Belgian government to the U. S. in order to obtain assistance and information with which to start a nuclear reactor program in that country. He spoke on the status of nuclear research there and on the present plans to build a pile reactor to explore the possibilities of atomic power development for peace time use, since Belgium is concerned over its sources of industrial power for the future. The favored models for a reactor seem to be either Brookhaven or Bepo in England, but it appears instead that a trial "unsophisticated" pile similar to CP-2 at Argonne may be built first to furnish training and ideas. He mentioned also the importance of the Belgian Congo to Belgian economy and its possible future industrial development by the use of atomic power.

Meeting of August 28, 1952

I. Photodisintegration and Photo Meson Production from Deuterium. Dr. R. M. Littauer.

While visiting at UCRL, Dr. R. M. Littauer of Cornell University spoke on the recent progress and results obtained with measurements of the photodisintegration of deuterium at 180 - 260 Mev. Also, discussed were the photon energy ranges together with the proton scattering angles as well as the π^+ and π^- cross sections for H, D, C, O, F, Al, etc.

II. Angular Distribution of Positive Pions from the Reaction $p + d \rightarrow \pi^+ + t$. W. J. Frank

In report UCRL-1819 Ruderman had calculated the expected angular distribution for the process $p + d \rightarrow \pi^+ + t$. The reaction had been viewed as a two-step process. The first step involves a $p + p \rightarrow d + \pi^+$ reaction between the incident proton and the proton in the deuteron; the second step involves a pickup process between the newly formed deuteron and the left-over neutron. The first step imposes a $\cos^2 \theta$ distribution, while the second step smears it slightly and reduces the cross section for forward center-of-mass triton angles (or those directions in the center-of-mass system in which the final triton moves opposite to the initial deuteron motion).

Our preliminary results are given in the following table. The differential cross sections are uncorrected except for pion absorption and decay in flight.

Triton Center-of-mass Angle	Differential Cross Section (micro-barns/steradian)
30°	0.11 ± 0.05
50°	.24 ± 0.04
70°	.18 ± 0.02
90°	.25 ± 0.03

In future runs better statistics will be obtained at 30° as well as for the backward angles to test whether the distribution has any $\cos^2 \theta$ tendencies.

Meeting of September 11, 1952

I. Recent Progress at Notre Dame. Dr. E. Guth.

Dr. E. Guth from the Physics Department of the University of Notre Dame while visiting at UCRL spoke on recent work in nuclear physics at

Notre Dame. The talk was subdivided into three parts corresponding to the three main physics groups at Notre Dame: the nuclear physics group, working on Be⁹ and D neutron threshold binding energies, on the continuous electron spectrum and on the large angle of electron scattering by nuclei; the physical electronics group, working on thermionic emission in an electric field; and, the polymers group, working on nuclear magnetic resonance in the study of transitions and free rotation bonds in molecules of polymers.