Meetings

West Coast Spectroscopists

The Second Conference of West Coast Spectroscopists, with support from the Office of Naval Research, was held February 3 and 4 at the California Institute of Technology in Pasadena. A varied program of invited survey papers and prepared briefer technical comments attracted 175 spectroscopists from all parts of the country. President Lee A. DuBridge opened the meetings and noted that, not very long ago, national meetings could not boast as large a group of spectroscopists as had been attracted to Pasadena.

The first technical session was devoted to discussions of infrared intensities, Richard M. Badger presiding. In a survey paper on infrared intensities of gases, D. F. Eggers of the University of Washington reviewed the impressive advances which have been made in recent years in experimental technique. Integrated intensities for selected vibration-rotation bands, determined either from infrared dispersion measurements or from infrared absorption studies, are generally in agreement within 20% or better although, in some cases, considerably larger discrepancies remain. Eggers stressed the inadequacies of theoretical interpretation and the need for refinement of the "stick vibrator" model, which attempts to associate infrared intensities with individual chemical bonds. H. Aroeste, California Institute of Technology, outlined a method for determining spectral line-shapes and absolute intensities through the use of single-path and multiple-path absorption measurements; S. Silverman and R. C. Herman of the Applied Physics Laboratory, Johns Hopkins University, discussed, respectively, recent high-resolution infrared absorption measurements and an important extension to Oppenheimer's theoretical analysis of the effect of vibration-rotation interactions on infrared intensities of diatomic molecules. Infrared intensities of liquids were discussed by G. M. Barrow, Northwestern University, who presented a survey of experimental and interpretive results with emphasis on observed intensity changes associated with solvent interaction. G. Pimentel, University of California at Berkeley, noted a qualitative relation between heats of solution and absolute intensities.

F. C. Lindvall presided over technical sessions concerned with limits of detectability in spectroscopic measurements. H. Cary of the Applied Physics Corporation of Pasadena discussed limits of detectability in absorption spectroscopy, to which G. Hare (Precision Radiation Instrument Company, Los Angeles) and L. Cahn

(Beckman Instruments, Fullerton) offered prepared comments. J. W. Kemp of the Applied Research Laboratories, Glendale, considered limits of detectability in emission spectroscopy. He was followed by C. E. Berry of Consolidated Engineering Corporation, Pasadena, with a lecture on limits of detectability in mass spectroscopy.

Among the highlights of the conference were a cocktail party (sponsored by West Coast instrument companies) and a dinner meeting attended by more than 100 guests. S. S. Penner, the Conference Chairman, introduced Caltech's Fritz Zwicky, who discussed "Spectroscopic Puzzles in Cosmology". Dr. Zwicky considered such problems as the origin of the red shift, morphological methods, novae and supernovae, etc.

The third technical session on the structure and spectroscopy of large molecules featured three invited speakers, K. Palmer presiding. G. B. B. M. Sutherland of the University of Michigan opened the meeting with a survey on the structure and infrared spectroscopy of polyethylene, which he considers to be an important unit in the elucidation of the structure of large molecules. He noted particularly the use of infrared spectroscopy in ruling out some proposed structural arrangements, although absorption studies and measurements of infrared dichroism are not sufficient by themselves to determine the structure of a large molecule. R. B. Corey, California Institute of Technology, discussed protein models worked out in collaboration with Linus Pauling, the 1954 Nobel Laureate in Chemistry. Dr. Corey recounted the evolution of basic ideas concerning structural arrangements, as well as verification of selected molecular models through recent x-ray studies. R. M. Badger, California Institute of Technology, concluded the session with summary remarks on the infrared spectra of amino acids, proteins, and polypeptides. He presented a series of motion pictures showing simple mechanical models of functional groups and their normal vibrations, occasionally interrupted by spurious wobblings.

The closing session of the conference was concerned with astrophysical spectroscopy, O. C. Wilson presiding. J. Kaplan of the University of California at Los Angeles discussed the spectroscopy of the upper atmosphere with special reference to recent advances in the understanding of the aurorae. He referred briefly to the International Geophysical Year and its anticipated achievements. R. B. King, California Institute of Technology, discussed relative and absolute *f*-value determinations for atomic transitions, both by use of the King furnace and through absorption studies on atomic beams. G. P. Weissler of the University of Southern California commented on absolute intensity measurements of the atmospheric gases in the vacuum ultraviolet using photometric techniques. J. L. Greenstein, California Institute of Technology, concluded the technical program with a discussion of topics in astrophysical spectroscopy. He showed pictures of spectroscopic facilities at the Mount Wilson and Palomar Observatories, outlined the problems involved in quan-

titative interpretation of spectra from nonisothermal sources, the distribution of elements in the solar atmosphere and the universe, and concluded with some interesting observations on the evolution of the elements.

The Second Western Spectroscopy Conference provided ample opportunity for spectroscopists to learn, from recognized authorities, about the use of spectroscopic techniques in fields other than their own. A technical program of the type presented at Pasadena offers an excellent opportunity if not for publication of original papers at least for study of current problems in related fields.

S. S. Penner
California Institute of Technology

Michigan Physicists Meet

An evening of physics—consisting of coffee hour, dinner, physics exhibit, and talk on nuclear pile physics —was held March 21st on the Western Michigan College campus. As was the case last year, it was sponsored jointly by the physics departments of Kalamazoo College and Western Michigan College. It was attended by physics major students and faculty from six other colleges and junior colleges.

The physics exhibit, following the dinner, was partly modeled after the exhibit of novel devices held in conjunction with G. W. Stewart's University of Iowa Colloquium of College Physicists every June. In this case, however, the competition was between undergraduate college students at the various schools instead of between the teachers. There were thirteen exhibits this year. The winners were selected by a vote of those viewing the exhibit. First prize went to John DeBree of Hope College for his diffusion cloud chamber. Second prize was awarded to Charles Kelly of Alma College for his apparatus for transmitting speech on a light beam.

The speaker of the evening was Frederick LaViolette of the Knolls Laboratory of the General Electric Company, who spoke on the subject "The Physics of the Nuclear Pile". About 125 attended the talk.

Ralph O. Kerman
Kalamazoo College

Radiation and Dielectrics

Approximately 150 physicists, chemists, and engineers attended a Conference on the Effects of Radiation on Dielectric Materials at the Naval Research Laboratory, Washington, D. C., on December 14–15, 1954. Both the Laboratory and the Office of Scientific Research of the Air Research and Development Command sponsored the meeting, at which 17 papers were presented, five on radiation chemistry, four on industrial utilization and test procedure, and eight on effects in inorganic dielectrics.

The radiation facilities and program at the Naval Research Laboratory were described by James H. Schulman, general chairman of the conference, following a welcome to the guests by E. O. Hulburt, director of research at NRL, and by Lt. Col. J. D. Warthman of the Air Research and Development Command.

The mechanisms of radiation chemistry, including the reactions of excited molecules, ionized molecules, and free and atomic radicals, were described by M. Burton, of the University of Notre Dame. S. E. Crecelius, Naval Research Laboratory, reviewed classical polymer chemistry as a guide for later radiation effects discussions of organic materials. T. D. Callinan, Naval Research Laboratory, presented results on polymerization using gamma rays. G values as high as 10^6 have been obtained and products formed by radiation are characterized by high melting points and greater densities. K. H. Sun of Westinghouse reviewed the effects of radiation on polymers, and J. Saldick of General Electric suggested that gamma rays, electron beams, and pile irradiation produce equivalent effects for equal energy absorption in organic materials. L. A. Wall of the National Bureau of Standards proposed that the radiation stability of organics could frequently be predicted on the basis of their thermal stability. Measurements by R. A. Meyer, now at Brookhaven National Laboratory, of radiation induced conductivity in organics indicated that it was electronic in character.

R. Smoluchowski of the Carnegie Institute of Technology presented a general introduction to the effects of high energy radiation in inorganic solids and with E. Pearlstein summarized work done at Carnegie on ionic conductivity and density changes in alkali halides. Aluminum oxide, quartz, synthetic spinel, and silica have been irradiated by G. J. Dienes and P. W. Levy of the Brookhaven National Laboratory with the production of some absorption bands probably due to "knock-on" interstitial atoms or ions. C. J. Delbecq, P. Pringsheim, and P. Yuster of the Argonne National Laboratory discussed the production and stability of color centers in alkali halides, mechanical strain in these materials, and radiation effects in sodium nitrate. The production of colloid dispersions by irradiation followed by annealing was discussed by R. L. Carter of North American Aviation. N. J. Kreidl of Bausch and Lomb described the properties of glass made insensitive to radiation by the addition of cerium and experiments aimed toward understanding this effect. W. Primak of the Argonne National Laboratory surveyed a wide range of physical changes in materials exposed to pile irradiation. Experiments on the effect of pile irradiation on refractory crystals such as zircon, quartz, and beryl were reported by D. S. Billington and M. C. Wittels of the Oak Ridge National Laboratory. W. J. Sturm of ORNL discussed experiments on the change of lattice parameter on pile bombardment of LiF and on the effect of annealing the damaged crystal.

The problems associated with the use of dielectric materials in nuclear reactors designed for production of energy were discussed in papers by G. W. Pomeroy and C. Mannal of the General Electric Company.

At a luncheon for the delegates, A. R. von Hippel of