

Meetings

Midwest Solid-State Conference

The fourth annual Midwest Solid-State Conference was held on October 29, 1955, at the University of Missouri with approximately 70 persons attending. This series of relatively informal conferences was started for the purpose of giving graduate students and faculty the opportunity to become better acquainted with persons and work in solid-state physics being done at other schools in their general area.

On the evening before the conference Professor Harvey Brooks of Harvard University gave an O. M. Stewart Lecture on the theory of the cohesive energy of simple metals.

The conference program itself contained sixteen papers representing seven universities and one research institution. The alkaline earth oxides received considerable attention in six papers from the Universities of Minnesota and Missouri. In one study at Minnesota on dissociation of the oxides by electron bombardment, evidence was found for the transfer of two electrons per dissociated atom. The yield is proportional to the square of the bombarding current density and is of a magnitude to be expected from the meeting of two independently produced excitons.

Electrical properties of new semiconducting compounds and interesting low-temperature conduction anomalies were discussed in papers from Iowa State College and Purdue University. The magnetic properties of some rare earths and rare earth alloys were described along with theoretical interpretations of their complex magnetic transitions in two additional papers from Iowa State College.

The rest of the papers allow no convenient grouping. Topics discussed include: ionic diffusion measurements (U. of Kansas); thermal properties of metals at high temperatures (Iowa State College); effective elastic moduli of polycrystals (Midwest Research Institute); luminescence (U. of Missouri); precision x-ray lattice constant measurements (U. of Missouri, School of Mines and Metallurgy); and the theory of the Overhauser nuclear polarization effect (St. Louis U.). This last paper brought out the interesting possibility of alignment either parallel or antiparallel to the electron magnetization depending on the relative importance of different kinds of spin relaxation processes.

The 1956 meeting will probably be held at the University of Chicago.

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Society of Rheology

The Annual Meeting of The Society of Rheology was held in New York City, November 2-4, 1955. Over 120 members and guests attended the technical sessions which were held at the Henry Hudson Hotel.

At the dinner on November 3, Dr. Herbert Leaderman of the National Bureau of Standards was presented the Bingham Medal of the Society. Dr. John D. Ferry, of the University of Wisconsin and recipient of the 1953 Bingham Award made the presentation. Dr. Ferry reviewed Dr. Leaderman's research and writings in the field of rheology and his work in preparing and promoting an international standard of nomenclature for the science of flow and deformation of materials.

The well-rounded technical program of the meeting was divided into five half-day sessions. Four papers on various aspects of the rheology of metals were presented at the first session, Wednesday afternoon. The mechanism by which a metal stores the energy of cold work was discussed. Data on the dynamic elastic modulus and plastic deformation of copper were presented in terms of theoretically predicted effects of interstitials and vacancies. The resistivity effects of short range order in α brass were presented in terms of relaxation times obtained from resistance increases induced by quenching and resistance decreases induced by neutron irradiation. A paper on the effects of combined stress on aluminum concluded the first session.

The growing interest in rheology in earth sciences was brought out by papers dealing with the deformation of the earth and flow patterns in glacier ice. Papers dealing with the magnet of fluid dynamics of both compressible and incompressible liquids and the deformation of porous viscoelastic anisotropic solids completed the second session.

The importance of rheological studies in relation to the behavior of the human body was demonstrated by data presented on the flow of synovial fluid in health and disease.

The mathematical approach to rheological problems was presented in three papers dealing with hypoelasticity, the stability of flow of incompressible viscoelastic fluids and the mechanical behavior of fibres.

Developments in the study of the viscoelastic properties of high-polymers was the subject of the fourth session. The use of stress-strain curves to characterize the properties of polyisobutylene was discussed and a testing method for determining the dynamic mechanical properties of plastics was presented with data on the behavior of polymethyl methacrylate. A method of determining the dynamic bulk modulus was described together with data taken over a wide frequency range on several rubber-sulfur mixtures. The similarity between the behavior of melts and polymer solutions was demonstrated with data on molten polyethylene.

The final session included a description of a vibratory gyro mass flowmeter and a method for the determination of structure in dispersions by viscometry. The gradient dependence of intrinsic viscosity was discussed