

Measuring Colloidal Particles

Particles whose radii are more than about one ten-thousandth of an inch can be measured with a microscope or by the scattering of visible radiation. The way in which x-rays scatter at small angles upon passing through a substance can be used to determine particle radii below a millionth of an inch or so. The work reported here is an account of the development of this small angle technique to cover the range between atomic and microscopic dimensions by the use of x-rays of extraordinarily long wavelength. This method should increase our knowledge of structure in the colloidal range, characterized by Ostwald as the "world of neglected dimensions." K.L.Y.

Particle Size Determination by Soft X-ray Scattering. By K. L. Yudowitch. *J. Appl. Phys.* 20: 174, February, 1949.

Air Friction

Any surface moving through a gas experiences a retarding force, or drag, due to the viscous nature of the gas. Under ordinary conditions of temperature and pressure, this retarding force will be determined by the size of the surface, its speed, and a fundamental constant of the particular gas concerned—its coefficient of viscosity. However, if the pressure of the gas is brought sufficiently below atmospheric pressure, the coefficient of viscosity is no longer independent of the pressure, and the nature of the frictional process involved is accordingly altered. In fact, at pressures of the order of one micron or lower the drag becomes directly proportional to the pressure. The problem may be further complicated when the surface is moving at a high speed, say greater than that of sound. Such would be the case of a body travelling at supersonic speeds in the upper atmosphere. An experimental determination of the drag on a surface moving under just such severe conditions of high speed and low pressure was carried out under carefully controlled laboratory conditions using air as the gaseous medium. Observations were made at pressures ranging from one-half to two hundred microns and at surface speeds as high as one and one-half times that of sound. Perhaps the most striking conclusion was that the retardation varied directly with the speed of the surface regardless of pressure, as kinetic theory might indicate, but that its variation with pressure was immediately explainable only at the very lowest pressures.

A.R.K.

Air Friction on Rapidly Moving Surfaces. By A. R. Kuhlthau. *J. Appl. Phys.* 20: 217, February, 1949.

A. V. ASTIN has been named chief of the electronics division of the National Bureau of Standards.

JOHN W. COLTMAN has been appointed manager of the electronics and nuclear physics department of Westinghouse Electric Corporation's research laboratories at Pittsburgh, where since 1945 he has been the head of the x-ray section.

Recent administrative appointments announced by Westinghouse Electric Corporation's new atomic power division are as follows: ROBERT A. BOWMAN, manager of engineering; E. L. KUNO, assistant to the division manager; L. C. MECHLING, JR., works engineer, and WILLIAM E. SHOUPP, director of research.

WILLIAM LEE DAVIDSON has recently been appointed director of the B. F. Goodrich Company's physical research department.

SAUL DUSHMAN, assistant director of the General Electric research laboratory since 1928, and an international authority on high-vacuum research, has retired after thirty-seven years as a G-E scientist. He will continue his association with the laboratory as a consultant.

LAWRENCE R. HAFSTAD has resigned from the Research and Development Board in Washington to accept the directorship of the new reactor development division of the Atomic Energy Commission. His successor is ROBERT FROSS RINEHART, previously director of its planning division.

ERNA M. J. HERREY of the department of physics of Queens College, Flushing, N. Y., has been promoted to the rank of assistant professor.

GEORGE E. HUDSON has been appointed professor of physics at New York University College of Engineering. Since 1946 he has been connected with Research Project Squid at the College, where jet propulsion studies are under way. He is at present technical director of the project, a post he will continue to fill.

MYER KESSLER has joined the National Bureau of Standards.

Stanford University announces that WALTER E. MEYERHOF, a physicist at the University of Illinois, will join the staff of its department of physics as an assistant professor. Another Illinois physicist, VINCENT SALMON of the Jenson Manufacturing Co., Chicago, has been appointed head of the sonics section of Stanford Research Institute's physics research department.

RODERIC M. SCOTT has joined the physics department staff of the Perkin-Elmer Corporation, Glenbrook, Connecticut.

MAURICE M. SHAPIRO, after a long career on the atomic energy project, has left the Oak Ridge National Laboratory to become head of the section on heavy-particle physics in the nucleonics division of the Naval Research Laboratory, Washington, D. C.