

and final values of the resistance are connected by a continuous line made up of segments of different slope, each segment corresponding to the propagation of a wavefront through the specimen. The initial and final values of the resistance explicitly define the change in resistivity due to the impact stress; the discontinuities in slope show the existence of multiple waves and define transit times for each wave from which the wave velocities can be calculated. The complications resulting from wave reflections and subsequent interactions, which are inherent in free surface velocity techniques, are avoided.

In order to determine the stress-volume relation, the particle velocity associated with each wave must be known in addition to the wave velocity. Because of symmetry, the total particle velocity imparted to the specimen disk is one-half the experimentally measured impact velocity. In general the division of the total particle velocity between multiple waves is unknown from a single experiment; however, if in a series of experiments the total particle velocity is systematically varied in the immediate neighborhood of a suspected cusp in the stress-volume relation until a change in the number of waves is observed, the particle velocity associated with each of the multiple waves can be established. The stresses and volumes associated with any multiple wave structure can then be calculated from conservation of mass and momentum relationships.^{4,5}

The stress-volume values determined in this manner are shown in Fig. 1 and compared to values obtained by Wackerle⁶ from a free surface velocity technique. Two cusps were observed and investigated, the first at 44 ± 4 kbar corresponds to the transition between elastic and plastic behavior, and the second at 140 ± 10 kbar is probably related to the phase transition between the diamond and β -tin crystal structures which was first observed by Minomura and Drickamer⁷ at a hydrostatic pressure of 120 kbar. The large uncertainties quoted result from limited data in the neighborhoods of the cusps rather than from lack of precision in the measurements.

The authors are indebted to J. Wackerle for allowing them to use his stress-volume data prior to publication.

* Work supported by the U. S. Atomic Energy Commission.

¹ S. Thunborg, G. E. Ingram, and R. A. Graham, *Rev. Sci. Instr.* **35**, 11 (1964).

² The techniques involved in a gun experiment are discussed by W. J. Halpin, O. E. Jones, and R. A. Graham in *ASTM Special Technical Publication No. 336, Symposium on Dynamic Behavior of Materials (ASTM 1963)*; and in Ref. 1.

³ R. G. McQueen, S. P. Marsh, and Jerry Wackerle, *Bull. Am. Phys. Soc.* **7**, 447 (1962).

⁴ G. E. Duval in *Response of Materials to High Velocity Deformation* (Interscience Publishers, Inc., New York, 1961), p. 165.

⁵ This assumes that the particle velocity associated with each cusp is independent of impact stress amplitude.

⁶ Jerry Wackerle, Los Alamos Scientific Laboratory, Los Alamos, New Mexico (private communication).

⁷ S. Minomura and H. G. Drickamer, *J. Phys. Chem. Solids* **23**, 451 (1962).

Erratum: New Oxy-Hydrogen Burner for Flame Fusion

[36, 1784 (1965)]

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THE burner developed at the Laboratory for Insulation Research (Ref. 6 in the paper) was incorrectly identified as a tricone burner. It is however, a three-tube coaxial-type postmix oxy-hydrogen burner. It might also be noted that L. Merker has a process patent describing a three-tube burner (L. Merker, U. S. Patent 2, 764,490-25, September 1956).

Announcements

Second International Biophysics Congress Vienna (Austria) 5-9 September 1966

THIS Congress is being organized by the International Organization for Pure and Applied Biophysics (IOPAB). General sessions of invited papers will be devoted to energy transfer and conversion, to molecular aspects of differentiation, and to emerging developments in biophysics. There will also be symposia arranged by the Commissions on: Molecular Biophysics, Cell and Membrane Biophysics, Communication and Control Processes, Radiation and Control Processes, Radiation Biophysics, by the Committee on Education, and by affiliated commissions of IOPAB. Contributed papers on all subjects of biophysics will be accepted. Abstracts of such papers are due by 15 May 1966. Inquiries should be directed as follows:

Scientific Program:

Secretariat: Wien, IX, Alserstrasse 4, Phone: 52-61-87, Wiener Medizinische Akademie, Mrs. E. Weidenhaus.

Housing, Travel Arrangements, and Entertainment Program:

Reisedienst der Wiener Medizinischen Akademie, Wien, IX, Alserstrasse 4, Phone: 63-45-13.

Commercial Exhibition:

F. Scherbetz, Wein, IX, Kinderspitalgasse 4, Phone: 42-33-47

Fourth International Conference on Quantum Electronics

The Fourth International Conference on Quantum Electronics will be held in Phoenix, Arizona, on 12-14 April 1966. The conference program will include contributed papers in all areas of quantum electronics, including the basic theory and basic physics of masers and lasers; advances in quantum electronic devices and technology; applications of quantum electronics, especially lasers, and related topics in physics, electronics, and optics. Authoritative papers are particularly sought in emerging laser applications areas, to shed light upon the present status and future prospects for significant laser applications in a wide spectrum of scientific and technological fields, including physics, chemistry, biology, medicine, metrology, communications, and others.

Information concerning conference registration and accommodations can be obtained from the Conference Chairman, Dr. J. P. Gordon, Bell Telephone Laboratories, Murray Hill, New Jersey. Abstracts of talks intended for presentation at the conference, in five copies and not over 4000 characters in length, must be submitted not later than January 3, 1966, to the Program Committee Chairman, Professor A. E. Siegman, Microwave Laboratory, Stanford University, Stanford, California 94305. Selected papers from the conference will be published in full after the conference in one or more conference issues of the *Journal of Quantum Electronics*. Final manuscripts for these conference proceedings must be submitted at the conference.

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