

ANNOUNCEMENTS

SECOND CONFERENCE ON KINETICS, EQUILIBRIA, AND PERFORMANCE OF HIGH TEMPERATURE SYSTEMS

The Combustion Institute, Western States Section

To be held at University of California at Los Angeles, 16-18 April 1962.

INVITATIONS are extended for papers for the Western States Section's Second Conference on Kinetics, Equilibria, and Performance of High Temperature Systems. The First Conference was held in November 1959, and approximately 40 papers were presented, dealing largely with the calculation of equilibrium chemical compositions of high temperature systems. These papers have recently been published by Butterworths. In the Second Conference it is intended to deal primarily with nonequilibrium aspects of high temperature systems, i.e., those in the temperature range from 3000° Rankine to 10 000° Rankine and above, although any new contributions in the field of chemical equilibrium will receive careful consideration. In this regard, attention might be directed toward analysis of multiphase systems, calculation of equilibrium at low exit temperatures (around 1000°R) in large expansion ratio nozzles, evaluation of the problem of a general freezing point for expansions to temperatures as low as about 500°R, and, importantly, consideration of the effects of iteration tolerance, accuracy of basic property data, and curve fitting approximations upon equilibrium performance results.

Thermodynamic and thermochemical species data

The preparation of the JANAF Thermochemical Tables by Dr. Daniel R. Stull and associates at the Dow Chemical Company has satisfied an urgent need, expounded at the First Conference, for provisional standards. Despite the great number of chemical species represented in the JANAF Tables, there remain some species of interest in high temperature calculations which are not represented, and for which compilations of appropriate data would be valuable. This is especially true of ions and other odd species which put in an appearance above 10 000°R in plasmas and some detonation waves. There is, of course, always interest in, and need for, presentation of new experimental data to effect revisions in previous "best" values. Standard data for reactants might be compiled, and hopefully by the time of the Second Conference a number of special fuels and oxidizers of present interest may be declassified, at least as regards basic thermochemical and thermophysical properties.

Theoretical equilibrium engine performance

As regards declassification, the publication of Dobbins's comprehensive calculational results, for theoretical rocket engine performance, in unclassified report form lends hope that other, even more comprehensive, compilations can be made on an unclassified basis

if the numbers are separated from the various application contracts on which many of them were derived. Perhaps a small committee might work together to compile a master collection of performance numbers, and then analyze the results for general results attributable either to chemical composition or to energy level. The effect of low chamber pressure operation upon theoretical performance in a variety of chemical systems would be of particular interest, as would also the theoretical performance of high temperature electrical and magnetic propulsion schemes.

Calculations for engine design

At the First Conference, a few calculational schemes were presented for jet propulsion engine design, with a limited amount of theoretical results. It is likely that since that time a variety of computer programs have been produced which deal with various aspects of engine performance and which incorporate means for evaluating constants and verifying models by correlation of computer output parameters with experimental data. Included in this category would be programs for the design of air-breathing engine inlets, supersonic combustors, and exhaust nozzles.

Evaluation of kinetic processes in engines

As always, there is much need for experimental data of an ordered nature, explained in terms of physical and chemical processes and thus reduced to appropriate terms for general application. In particular, there might be noted the kinetics of vaporization, combustion reactions, and reassociation reactions during exhaust gas expansion, as well as the characteristics of two-phase (gas plus particle) flow.

Other high temperature systems

While all of the above discussion is centered around engine considerations, particularly jet propulsion engines, the concept of the Second Conference will include other high temperature systems than those created by jet propulsion fuels and oxidizers, over the approximate temperature range of 3000°R to 10 000°R above. This means inclusion of such diverse fields as detonation waves of all sorts, ablation heat transfer, chemical processing at elevated temperatures, and thermokinetics of flames generally and of high temperature materials technology.

The Western States Section's standing technical committee on Kinetics, Equilibria, and Performance of High Temperature Systems is chaired by Mr. Gilbert S. Bahn, 16902 Bollinger Drive, Pacific Palisades, California. Communications relative to the program

generally, such as brief abstracts of possible papers, should be addressed to Mr. Bahn. Also serving actively on the committee at the present time are Messrs. Harold E. Brandmaier, S. E. Stephanou, H. J. Vale, Alfred Büchler, and D. S. Villars. Organization of the full committee in terms of programming for the Second Conference is now under way, and additional appointments will be made in the near future. Specific papers offered for the Second Conference will be reviewed by Dr. Melvin Gerstein, Papers Review Committee Chair-

man for the Western States Section, and members of his committee. Completed texts of papers should be sent directly to Dr. Gerstein, whose address is Dynamic Science Corp., 1445 Huntington Drive, South Pasadena, California.

Prospective authors should note that 300 copies of preprints will be required to be furnished to the Section for distribution to Conference registrants, and should arrange well in advance of the Conference to complete any requisite security review of their papers.

THE NINTH INTERNATIONAL SYMPOSIUM ON COMBUSTION

THE Ninth International Symposium on Combustion will be held at Cornell University, Ithaca, New York, during the week of 27 to 31 August 1962, inclusive. It will be the fourth symposium organized under the auspices of The Combustion Institute. The local arrangements are being made by the Department of Thermal Engineering at Cornell. The Institute and the local sponsors welcome the participation of all members of the organization, together with all scientists and engineers interested in combustion.

Local arrangements for the meeting

Headquarters for the meeting will be Upson Hall of the Sibley School of Mechanical Engineering, which is situated on the engineering campus of the university. This is located at the south end of the main campus, within walking distance of the dormitories and the eating facilities on the campus.

Dormitory rooms will be available, mainly in the recently built student dormitory block. Some rooms will be available for single women and couples can be accommodated. The surrounding district contains a number of hotels and motels for which information will be provided in the next announcement. Meals will be available by special arrangement with the University Department of Residential Halls and there are many nearby restaurants.

If you plan to attend the 1962 Symposium, kindly write, at your earliest convenience, to

Combustion Symposium Office, Upson Hall
Sibley School of Mechanical Engineering
Cornell University
Ithaca, New York.

Symposium agenda

The technical program of the Ninth International Combustion Symposium is planned to include two *Discussions*, three *Colloquia* and *Contributed Papers*. The *Discussions* and *Colloquia* are intended to lead to interchange of information in specific areas where an intensive review of the known theoretical and experimental facts is desirable. *Contributed Papers* will be accepted in all areas of the Combustion Field. When parallel sessions are unavoidable, an effort will be made to schedule papers in the same general area of interest at such times as to make attendance at all of them possible.

Discussions

The Discussion topics are (a) *Fundamental Flame*

Processes (with emphasis on the Structure of Flames) and (b) *Detonations*. The *Discussions* will revolve around *invited preprinted* papers, available for distribution several weeks before the Symposium.

Combustion Symposium participants are urged to take an active part in the *Discussions*. Their value and success depends to a large measure on the quality of the contributions from the audience. A brief summary by the authors of the highlights of their papers will be followed by extended discussions from the floor. It is particularly desirable to present unpublished material that is germane to the topics of the *Discussions*. Participants are requested to procure preprints and to prepare their comments prior to the meeting. The papers and relevant comments will be published in the Symposium Proceedings. Further information will be given in the Second Announcement.

Colloquia

The *Colloquia* topics are (a) *Modeling Techniques* (Engines, Furnaces, Fires), (b) *Chemical Reactions and Phase Changes in Supersonic Flow* (with emphasis on Nozzle Flow), (c) *Reciprocating Engine Combustion Research*. The *Colloquia* papers will be presented in full, followed by comments from the floor. The papers will not be preprinted but will be published in the Symposium Proceedings. Further details can be obtained from the Chairman, Papers Subcommittee.

Contributed papers

The Papers Subcommittee will select *Contributed Papers* on the basis of 800–1000 word *Abstracts*, with a view to technical content and suitability for public presentation. Three copies of the *Abstracts* are to be submitted to The Combustion Institute, 936-B Union Trust Building, Pittsburgh 19, Pennsylvania, not later than 1 February 1962.

Three copies of the manuscripts of the complete *Contributed Papers* are due at The Combustion Institute on or before 1 May, 1962, and will be reviewed prior to publication in the Symposium Proceedings. It is requested to restrict the length of the papers to 4000 words or less.

Time allotted to individual *Contributed Papers* is 15–20 minutes, with 5–10 minutes for comments. *Abstracts* (revisable up to 1 May 1962) of all accepted papers will be bound together for distribution at the Symposium.