

Mines Branch Information Circular IC 260

BIBLIOGRAPHY OF HIGH-TEMPERATURE CONDENSED
STATES RESEARCH PUBLISHED IN CANADA,
OCTOBER - DECEMBER, 1970

by

Norman F. H. Bright*

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SYNOPSIS

This report contains bibliographic information concerning research work on high-temperature condensed states published in Canadian journals from October 1 to December 31, 1970.

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Direction des mines, Circulaire d'information IC 260

BIBLIOGRAPHIE DES RECHERCHES EFFECTUÉES DANS LE DOMAINE
DES ÉTATS CONDENSÉS AUX TEMPÉRATURES ÉLEVÉES, AU CANADA,
D'OCTOBRE À DÉCEMBRE, 1970

par

Norman F.H. Bright*

RÉSUMÉ

Le présent rapport contient des renseignements bibliographiques sur les recherches effectuées sur les états condensés aux températures élevées, publiées dans les revues scientifiques canadiennes au cours de la période d'octobre 1 à décembre 31, 1970.

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INTRODUCTION

This report is a further contribution to the series of bibliographic bulletins of information on high-temperature condensed states research that have been published as Mines Branch Information Circulars since March 1960 on behalf of the Commission on High Temperatures and Refractories of the International Union of Pure and Applied Chemistry. The present document covers the three-month period from October 1 to December 31, 1970 and gives details of work published in Canadian scientific and technical journals during that period.

Anyone not now receiving these reports who wishes to do so, or anyone who currently receives these bibliographies but to whom they are no longer of interest, is requested to advise the compiler accordingly so that the appropriate changes may be made in the relevant mailing lists.

The compiler would very much appreciate being advised of any work published in Canadian journals, and lying within the scope of these bibliographies, that has escaped his notice in order that such work may be mentioned in a subsequent issue of this series of Information Circulars.

Any further information concerning these bibliographies or any of the other relevant IUPAC activities can be obtained from the compiler of this report at the following address:

Dr. Norman F.H. Bright,
Mineral Sciences Division,
Mines Branch,
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555 Booth Street,
Ottawa 1, Ontario.

The compiler of these bibliographies wishes to draw the attention of those recipients who have been in the habit of also taking the quarterly bibliographies that have been produced on an international basis for several years by Mr. J. J. Diamond of the National Bureau of Standards, Washington, D. C., that a major change in this arrangement has now taken place.

These international bibliographies will no longer be produced by the N. B. S. In future, these documents will be compiled by:

Dr. M. G. Hocking,
Department of Metallurgy,
Royal School of Mines,
Imperial College of Science and Technology,
Prince Consort Road,
London, S. W. 7,
England.

Those wishing to receive these quarterly international documents in the future should communicate their wishes directly to Dr. Hocking at the above address. As in the past, the Canadian contribution will appear incorporated into the international bibliography, in addition to appearing, generally about three months earlier, in the present series of Information Circulars.

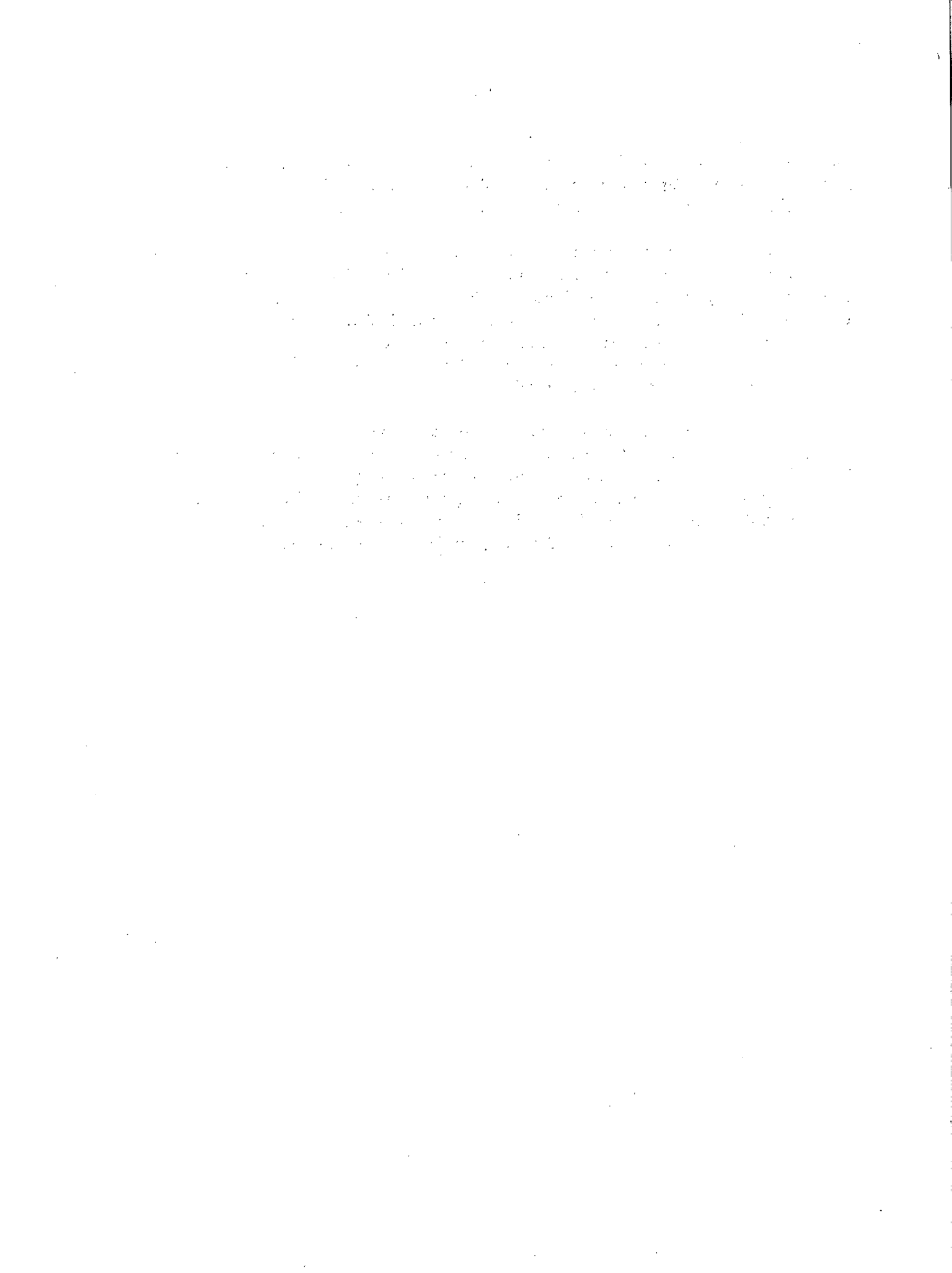
The compiler of the present series has been asked by Dr. Wm. S. Horton of the N. B. S., the Chairman of the IUPAC Commission on High Temperatures and Refractories, to insert the following notice in this issue of the Bibliographies: "It is hoped to make the production of the documents completely self-supporting financially. On the recommendation of Professor O. Glemser, Chairman of the Inorganic Division of IUPAC, the Bureau of IUPAC agreed to advance \$360 from the Division's contingency fund. This is to be regarded as a "once only" payment by IUPAC and the Bibliography hereafter must stand on its own feet financially and not enjoy any further support from IUPAC. You may have received an issue already. Please note the need for numerous subscriptions to keep the publication alive. The subscription is \$3.60 (U. S.) for four issues, including surface mail from London, England. Air-mail delivery is \$0.96 (U. S.) extra for Europe and \$1.92 (U. S.) elsewhere. Cheques in equivalent currency negotiable in Great Britain should be made payable to 'IUPAC High-Temperature Bibliography'. It will be to your advantage to support this effort".

At a recent meeting of the Commission and as a result of correspondence between various members of the Commission, it has been suggested that the coverage of research reported in these bibliographies should be modified somewhat. This need has arisen because, in Section D, headed "Properties, at temperatures below 1000°C, of materials that melt above 1500°C", many papers have been reported that have no relevance to high-temperature chemistry or physics. They merely dealt with lower-temperature properties of materials that, themselves, happened to be high-melting. The work reported had no higher-temperature connotation. In future, research conducted entirely below 1000°C will be included only when it is directly relevant to high-temperature work, such as heat capacities and heats of formation of refractory materials. In a similar way, it is intended to curtail slightly the amount of papers reported in Section G, entitled "Phase Equilibria". In future this Section will carry the heading "Phase Equilibria above 700°C". In the past, many papers

have been included in which the temperatures involved were often substantially below this figure; this intended restriction will ensure that the Bibliography is more truly a "high-temperature" document.

By way of compensation, however, it has been resolved to extend the coverage of Section H, hitherto entitled "Reactions at temperatures above 1000°C", so that it will now be headed "Reactions at temperatures above 700°C". This will have the effect of including many papers of metallurgical and ceramic interest that would otherwise have been excluded, and will make the Bibliography consistent insofar as the contents of Sections G and H are concerned.

These modifications of coverage have been adopted in the compilation of the present document and, unless a contrary notification is received from the Commission, will be continued in subsequent issues. Nevertheless, the compiler would appreciate receiving any reactions from the readers of these Bibliographies to these changes of coverage; any comments received will be passed on to the Commission for their consideration.



BIBLIOGRAPHY OF WORK ON HIGH-TEMPERATURE
CONDENSED STATES PUBLISHED IN CANADA,
OCTOBER - DECEMBER, 1970

International Union of Pure and Applied Chemistry
Commission on High Temperatures and Refractories

Bibliography (October 1 to December 31, 1970)

Collected by Dr. Norman F.H. Bright, Mines Branch, Ottawa.

A. Devices for achieving temperatures above 1500°C

1. Laser-Produced Plasmas at N. R. C. 's Physics Division.
A.J. Alcock (Physics Division, National Research Council of
Canada, Ottawa, Ontario).
Canad. Res. and Devel., 3 [6], 19-22 (1970).

B. Devices for measuring and controlling temperatures above 1000°C

1. How to Handle Instrumentation and Control for High-Temperature
Incineration.
J.M. Currie and P.E. Finer (American Thermogen, Inc., location
not specified).
Canad. Controls and Instr., 9 [11], 18-19 (1970).

C. Devices for physical measurements at temperatures above 1000°C

1. The Laser and Thermal Conductivity Determinations.
I.D. Peggs (Whiteshell Nuclear Research Establishment, Atomic
Energy of Canada Limited, Pinawa, Manitoba).
Canad. Res. and Devel., 3 [6], 22-25 (1970).

D. Properties, at temperatures below 1000°C, of materials that melt
above 1500°C

a. Metallic materials

1. Predicting Microstructure from Heat Flow Calculations in Electron-
Beam-Welded Eutectoid Steels.
J.A. Goldak, G. Burbidge and M.J. Bibby (Faculty of Engineering,
Carleton University, Ottawa, Ontario).
Canad. Metall., Quart., 9 [3], 459-466 (1970).
2. A Comparison Between the Predicted and Experimental Microstructure
of Electron-Beam-Welded Eutectoid Steels.
J.A. Goldak, G. Burbidge and M.J. Bibby (Faculty of Engineering,
Carleton University, Ottawa, Ontario).
Canad. Metall. Quart., 9 [3], 467-473 (1970).

b. Non-metallic materials

1. The Effect of Charge-Transfer Processes on the Colour and Pleochroism of Amphiboles.
G.H. Faye and E.H. Nickel (Mineral Sciences Division, Mines Branch, Department of Energy, Mines and Resources, Ottawa, Ontario).
Canad. Mineral., 10 [4], 616-635 (1970).
2. Racah Parameters and their Relationship to Lengths and Covalencies of Mn²⁺ - and Fe³⁺ - Oxygen Bonds in Silicates.
P. G. Manning (Inland Waters Branch, Department of Energy, Mines and Resources, Ottawa, Ontario).
Canad. Mineral., 10 [4], 677-688 (1970).

c. Mixed materials

Nil

E. Properties, at temperatures above 1000°C, of materials that melt above 1500°C.

a. Metallic materials

1. Entrapment of Helium Ions at (100) and (110) Tungsten Surfaces.
E. V. Kornelsen (Radio and Electrical Engineering Division, National Research Council of Canada, Ottawa, Ontario).
Canad. Journ. Phys., 48 [23], 2812-2823 (1970).

b. Non-metallic materials

1. High-Temperature Properties of the Ising Model on the Octahedral Lattice.
J. Oitmaa and C.J. Elliott (Theoretical Physics Institute, Department of Physics, University of Alberta, Edmonton, Alberta).
Canad. Journ. Phys., 48 [20], 2383-2390 (1970).

c. Mixed materials

Nil

F. Properties, at temperatures above 1000°C, of materials that melt below 1500°C.

Nil

G. Phase equilibria above 700°C

1. The Ternary System Silver-Indium-Aluminum.
A.N. Campbell and R. Wagemann (Department of Chemistry, University of Manitoba, Winnipeg, Manitoba).
Canad. Journ. Chem., 48 [20], 3164-3172 (1970).
2. Calculated Phase Relations in the System CaCO_3 - SrCO_3 .
E. Froese (Geological Survey of Canada, Department of Energy, Mines and Resources, Ottawa, Ontario).
Canad. Mineral., 10 [4], 665-676 (1970).
3. The Rubidium Chloride - Sodium Chloride Phase Diagram.
A.D. Pelton and S.N. Flengas (Department of Metallurgy and Materials Science, University of Toronto, Toronto, Ontario).
Canad. Journ. Chem., 48 [22], 3483-3486 (1970).
4. A Pyroxene Solvus Section.
A.C. Turnock (Department of Earth Sciences, University of Manitoba, Winnipeg, Manitoba).
Canad. Mineral., 10 [4], 744-747 (1970).

H. Reactions at temperatures above 700°C.

1. Thermogravimetric Analysis of Ontario Limestones and Dolomites:
I. Calcination, Surface Area and Porosity.
R.K. Chan (Department of Chemistry, University of Western Ontario, London, Ontario), K.S. Murthi and D. Harrison (Chemical Research Department, Ontario Hydro Research Division, Toronto, Ontario).
Canad. Journ. Chem., 48 [19], 2972-2978 (1970).
2. Thermogravimetric Analysis of Ontario Limestones and Dolomites:
II. Reactivity of Sulphur Dioxide with Calcined Samples.
R.K. Chan (Department of Chemistry, University of Western Ontario, London, Ontario), K.S. Murthi and D. Harrison (Chemical Research Department, Ontario Hydro Research Division, Toronto, Ontario).
Canad. Journ. Chem., 48 [19], 2979-2982 (1970).

3. The Role of Calcium Sulphite in Desulphurizing Gases Containing Sulphur Dioxide.
P. Marier and T. R. Ingraham (Extraction Metallurgy Division, Mines Branch, Department of Energy, Mines and Resources, Ottawa, Ontario).
Mines Branch Research Report R222, March 1970 (Mines Branch, Department of Energy, Mines and Resources, Ottawa, Ontario).
4. The Hydrogen Sulphide Route to Sulphur Recovery from Base Metal Sulphides: Part I. The Generation of H_2S from Base Metal Sulphides.
H. W. Parsons and T. R. Ingraham (Extraction Metallurgy Division, Mines Branch, Department of Energy, Mines and Resources, Ottawa, Ontario).
Mines Branch Information Circular IC 242, June 1970 (Mines Branch, Department of Energy, Mines and Resources, Ottawa, Ontario).
5. The Hydrogen Sulphide Route to Sulphur Recovery from Base Metal Sulphides: Part II. The Recovery of Sulphur from Gases containing H_2S .
R. F. Pilgrim and T. R. Ingraham (Extraction Metallurgy Division, Mines Branch, Department of Energy, Mines and Resources, Ottawa, Ontario).
Mines Branch Information Circular IC 243, June 1970 (Mines Branch, Department of Energy, Mines and Resources, Ottawa, Ontario).
6. The Hydrogen Sulphide Route to Sulphur Recovery from Base Metal Sulphides: Part III. The Recovery of Iron Products from Ferrous Chloride Solutions.
D. A. Reeve and T. R. Ingraham (Extraction Metallurgy Division, Mines Branch, Department of Energy, Mines and Resources, Ottawa, Ontario).
Mines Branch Information Circular IC 244, June 1970
(Mines Branch, Department of Energy, Mines and Resources, Ottawa, Ontario).
7. Studies on Metal Hydroxy Compounds: XII. Thermal Analyses, Decomposition Kinetics and Infrared Spectra of Copper Basic Oxy salts.
P. Ramamurthy and E. A. Secco (Chemistry Department, St. Francis-Xavier University, Antigonish, Nova Scotia).
Canad. Journ. Chem., 48 [22], 3510-3519 (1970).

J. Review article

1. A Review of Copper Converting.

D. A. Reeve (Extraction Metallurgy Division, Mines Branch,
Department of Energy, Mines and Resources, Ottawa, Ontario).
Mines Branch Information Circular IC 212, November 1968
(Mines Branch, Department of Energy, Mines and Resources,
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