

Mines Branch Information Circular IC 276

BIBLIOGRAPHY OF HIGH-TEMPERATURE CONDENSED
STATES RESEARCH PUBLISHED IN CANADA,
JULY-SEPTEMBER, 1971

by

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SYNOPSIS

This report contains bibliographic information concerning research work on high-temperature condensed states published in Canadian journals from July 1 to September 30, 1971.

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Direction des mines, Circulaire d'information IC 276
BIBLIOGRAPHIE DES RECHERCHES EFFECTUÉES
DANS LE DOMAINE DES ÉTATS CONDENSÉS AUX
TEMPÉRATURES ÉLEVÉES, AU CANADA,
DE JUILLET À SEPTEMBRE, 1971

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 de juillet 1 à septembre 30, 1971.

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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 July 1 to September 30, 1971, 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:

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The Commission on High Temperatures and Refractories held meetings in Washington, D.C., on July 15-17, 1971, inclusive, as part of the XXVth Conference of IUPAC. The meetings were attended by the following personnel:

Dr. W.S. Horton (U.S.A.)	Chairman
Prof. G.D. Rieck (Netherlands)	Secretary
Prof. C.B. Alcock (Canada)	Titular Member
Prof. R. Collongues (France)	Titular Member
Prof. E. Fitzner (W. Germany)	Titular Member

Prof. F. Cabannes (France)	Associate Member
Prof. G. de Maria (Italy)	Associate Member
Dr. N.F.H. Bright (Canada)	National Representative

The only titular member not present was Prof. A.E. Sheindlin of the U.S.S.R. This was the first meeting in the history of the Commission at which Canada has had a Titular Member, viz., Prof. C.B. Alcock of the University of Toronto.

Although the minutes of the meeting have not yet received final approval, it can, nevertheless, be quite safely stated that the following subjects came under decision:

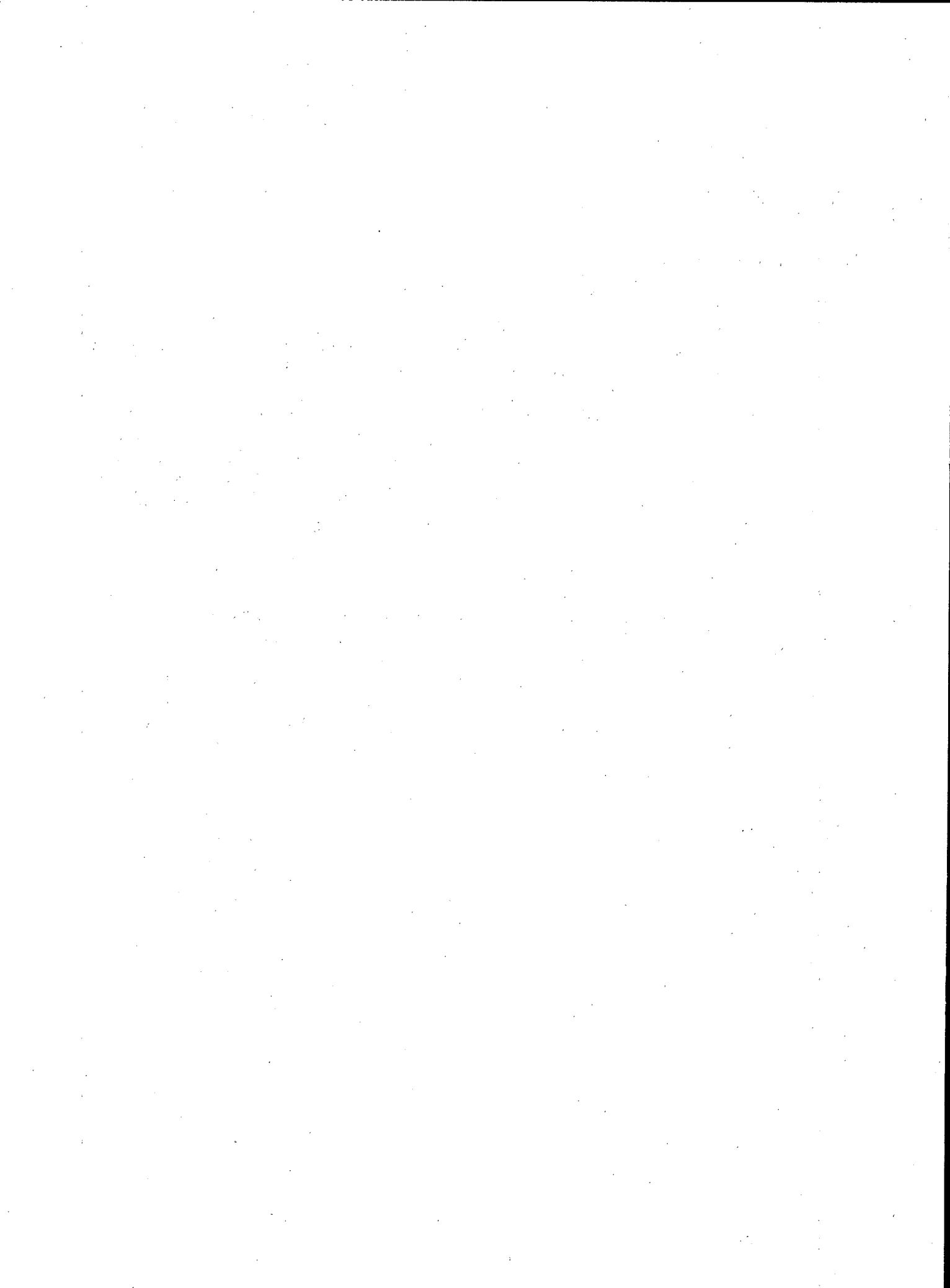
- (i) Standards for vapour pressure measurements. It was recommended that the metals Au, Ag and Cd were the most suitable metals currently available for use in their appropriate temperature ranges for vapour pressure standards. Tungsten and platinum, and also certain refractory oxides, are under consideration and will be discussed again at a later meeting.
- (ii) The Bibliographies were favourably regarded, with the new arrangement for publication by Dr. M.G. Hocking of London, England, now working satisfactorily. It was agreed that the Section H (Reactions at temperatures above 700°C) would be subdivided as follows:
 - (a) Chemical reactions, generating "another substance".
 - (b) Crystal growth of a component from melt or vapour.
 - (c) Physical diffusion without the formation of a new component.

This sub-division has been adopted in the present document. It was further suggested that the price of the international bibliographies would be \$3.60 for the three issues to be published in 1972 after the March issue, which is included in the current subscription, but that the price would be \$4.80 per calendar year after January 1, 1973. It was agreed that the bibliography was a proper medium through which to bring to the attention of recipients the notice of forthcoming relevant meetings and conferences. Relevant news items could also appropriately be included.

- (iii) The IUPAC Congress, to be held in Hamburg, Germany, in 1973, would incorporate a three-day symposium, to be organized by Professor C.B. Alcock, and the following session titles were suggested:
 - a. Generation of high temperatures.
 - b. Measurement of high temperatures.
 - c. Electrochemical and other chemical methods.
 - d. Calorimetry and physical methods.
 - e. Structure determination at high temperatures.
 - f. General session.

The temperature range to be discussed is 1000°K to 4000°K.

- (iv) Hot corrosion would form the subject of a conference in Copenhagen, Denmark, in April 1972.
- (v) A monograph on Carbon is to be prepared by Professor E. Fitzer in the near future.
- (vi) The Newsletter, originally started by Dr. D. Cubicciotti of the U.S.A., had not received strong support and would be discontinued. News items could, as stated above, be published in the Bibliographies.
- (vii) Standards for Melting Points. This work is to be continued; oxides suggested as possible were Y_2O_3 , Er_2O_3 and ZrO_2 , and also the metals Mo, Nb and Ta. It was realised that, with oxides, non-stoichiometry at high temperatures could be a problem. Dr. Marc Foëx of the Laboratoire des Ultra-Réfractaires, Odeillo, France, was to be asked to co-ordinate a task force to work on this subject.
- (viii) Industrial Liaison. It was suggested that, in order to make the Commission's activities more relevant in the industrial context, it would be advisable to have at least one associate member from this area; the name of an Italian industrialist was suggested as a possibility.
- (ix) Name of Commission. In view of the ill-defined meaning of the term "Refractories", and also the ill-defined composition of such materials, permission is to be sought from the Council of IUPAC to change the name of the Commission to "Commission on High Temperatures and Refractory Materials".
- (x) New Work. Several possibilities for new activities for the Commission were discussed, and will be dealt with again at the next meeting, possibly in Paris, in October, 1972.



BIBLIOGRAPHY OF WORK ON HIGH-TEMPERATURE
CONDENSED STATES PUBLISHED IN CANADA,
JULY-SEPTEMBER, 1971

International Union of Pure and Applied Chemistry
Commission on High Temperatures and Refractory Materials

Bibliography (July 1 to September 30, 1971)
for Canada

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

A. Devices for achieving temperatures above 1500°C

1. A Plasma Furnace for Ashing Micro-Samples of Particulate Matter.
W.K. Boyd and R.K. Jeffrey (Fuels Research Centre, Mines Branch,
Department of Energy, Mines and Resources, Ottawa, Ontario).
Mines Branch Technical Bulletin TB 136, June 1971 (Mines Branch,
Department of Energy, Mines and Resources, Ottawa, Ontario).

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

Nil

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

Nil

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

a. Metallic materials

Nil

b. Non-metallic materials

Nil

c. Mixed materials

1. Interaction of CO₂ Laser Radiation with Solids.
I. Drilling of Thin Metallic Sheets.
J.N. Gonsalves and W.W. Duley (Centre for Research in
Experimental Space Science and Physics Department,
York University, Toronto, Ontario).
Canad. Journ., Phys., 49 [13], 1709-1713 (1971).

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

Nil

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

Nil

G. Phase equilibria above 700°C.

1. On the Stability of Precipitate-Matrix Interfaces in Dilute Ternary Systems.
D.E. Coates (Department of Metallurgy, University of British Columbia, Vancouver, British Columbia).
Canad. Journ. Phys., 49 [13], 1805-1812 (1971).
2. Local Equilibrium in a Two-Pyroxene Amphibole.
C.J.N. Fletcher (Department of Geological Sciences, Queen's University, Kingston, Ontario).
Canad. Journ. Earth Sci., 8 [9], 1065-1080 (1971).
3. A Study of the Fe-Ti Oxides in the Whitestone Anorthosite, Dunchurch, Ontario.
Ulrich K. Kretschmar and Robert H. McNutt (Department of Geology, McMaster University, Hamilton, Ontario).
Canad. Journ. Earth Sci., 8 [8], 947-960 (1971).

H. Reactions at temperatures above 700°C.

(a) Chemical reactions generating another substance.

1. Studies on Metal Hydroxy Compounds. XIII: Thermal Analyses and Decomposition Kinetics of Hydroxystannates of Bivalent Metals.
P. Ramamurthy and E.A. Secco (Chemistry Department, St. Francis-Xavier University, Antigonish, Nova Scotia).
Canad. Journ. Chem., 49 [17], 2813-2816 (1971).
2. The Removal of Oxide Impurities from Alkali Metal Fluoride Melts by Addition of Silver Halide.
Sydney H. White (Department of Chemical Engineering, University of New Brunswick, Fredericton, New Brunswick).
Canad. Journ. Chem., 49 [14], 2462-2464 (1971).

(b) Crystal growth of a component from melt or vapour.

1. Crystal Growth. Part I: Background to Crystal Growth.
L.G. Ripley (Mineral Sciences Division, Mines Branch,
Department of Energy, Mines and Resources, Ottawa,
Ontario).
Mines Branch Research Report R 235, March 1971 (Mines
Branch, Department of Energy, Mines and Resources,
Ottawa, Ontario).

(c) Physical diffusion without the formation of a new component.

1. The Dissolution of Fused Quartz in Ferrous Silicate Melts.
D.A. Reeve (Metals Reduction and Energy Centre, Mines
Branch, Department of Energy, Mines and Resources,
Ottawa, Ontario).
Mines Branch Research Report R 240, July 1971 (Mines
Branch, Department of Energy, Mines and Resources,
Ottawa, Ontario).

I. Review Articles

1. Equipment for the Incineration of Municipal Waste.
F.D. Friedrich (Fuels Research Centre, Mines Branch,
Department of Energy, Mines and Resources, Ottawa, Ontario).
Mines Branch Technical Bulletin TB 134, April 1971 (Mines
Branch, Department of Energy, Mines and Resources, Ottawa,
Ontario).
2. The Final Half-Century of Charcoal Iron Production in Quebec,
1861-1911.
David J. McDougall (Geology Department, Loyola College,
Montreal, Quebec).
Canad. Min. Journ., 92 [8], 30-34 (1971).