International Committee of Electrochemical Thermodynamics and Kinetics

Comité International de Thermodynamique et de Cinétique Electrochimiques (C.I.T.C.E.)

Proceedings of the Seventh Meeting
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PREFACE

THE International Committee of Electrochemical Thermodynamics and Kinetics (C.I.T.C.E., or Comité International de Thermodynamique et de Cinétique Electrochimiques) is a group of research workers interested in common problems and collaborating in all possible ways on an agreed programme.

The papers and discussions of the seventh meeting, published herein, are, as previously, a general picture of the work and opinions of the group at the time of the meeting. The rapid evolution of electrochemistry necessarily makes it impossible to present anything like a finished picture, even of the limited fields undertaken by some of the C.I.T.C.E. Commissions. We nevertheless hope that the present volume will be found of use.

T. P. H.

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(1954–1955)

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A TRIBUTE TO THE MEMORY OF PROFESSOR WENDELL MITCHELL LATIMER (1893–1955)

WHEN, shortly after the creation of the International Committee of Electrochemical Thermodynamics and Kinetics in 1949, our Secretary General M. Pourbaix called on Professor W. M. Latimer at the University of California in Berkeley and discussed with him our aims and our scientific programme, the eminent author of 'The Oxidation States of the Elements and their Potentials in Aqueous Solutions' expressed his great interest and gave us his valuable encouragement. The project of establishing an atlas of potential–pH diagrams appealed particularly to Professor Latimer, whose systematic work on oxidation states and potentials constitutes the very basis of this most important phase of C.I.T.C.E. activities.

A few months before the C.I.T.C.E. meeting of 1953 in Stockholm Professor Latimer joined our organization as an active member. He attended part of this meeting and presented a most interesting paper dealing with his well-known work on ionic entropies. He also participated in the sessions of the Commission on Electrochemistry of the International Union of Pure and Applied Chemistry and voted with the majority of the members of this Commission in favour of the Stockholm conventions concerning the signs of electromotive forces and electrode potentials.

Professor Latimer had made plans to attend the July 1955 meetings of I.U.P.A.C. in Zurich and of C.I.T.C.E. in Lindau. He had sent a note on the signs of electrode potentials for presentation at the latter meeting, showing once more his spirit of cooperation. However, the end came a few weeks before these meetings.

This untimely death constitutes a severe loss for science and for the innumerable organizations and activities to which Professor Latimer contributed so much with such very great distinction. Our C.I.T.C.E. group in particular has lost a most valuable collaborator and friend.

Wendell Mitchell Latimer was born in Garnett, Kansas, in 1893. He graduated from the University of Kansas in 1915 and taught at that University for two years. He then went to the University of California in Berkeley where he obtained the doctorate and remained, for the rest of his career, as a member of the staff assembled by the illustrious G. N. Lewis. His fundamental contributions to thermodynamics, electrochemistry, inorganic chemistry, etc., are too well known to need enumeration here. During the war years he worked on several important governmental assignments and, among other contributions, carried out much of the pioneering work which led to the discovery of the transuranium elements. His familiarity with oxidation-reduction potentials enabled him to work out the uranium-plutonium separation.

Professor Latimer received numerous honours, among which we shall mention only two: membership in the National Academy of Sciences and, a few months before his death, the coveted Nichols Medal of the New York Section of the American Chemical Society.

P. van R.

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INTRODUCTION

1.1

OPENING ADDRESS

E. LANGE

C.I.T.C.E. National Secretary for Germany

PROF. Dr. E. Lange welcomed the participants of the meeting and wished them a happy and successful time.

He particularly thanked the national authorities for their generous help, which should assure the success of the meeting at Lindau and which had greatly simplified his organizing task.

He recalled briefly the history of C.I.T.C.E., and commented on its present structure and its possible future development. For instance, a new section relating to semi-conductors was to be inaugurated this year with several valuable contributions from eminent specialists in the field.

In concluding, Prof. Lange underlined the usefulness of C.I.T.C.E. for the future development of electrochemistry.

1.2

ADDRESS OF WELCOME

THE MAYOR OF LINDAU

THE Mayor of Lindau, welcoming delegates on behalf of his city, said that they had come to an island that was becoming more and more linked to the mainland. The advances of science were nowadays usually beyond the understanding of the ordinary man, but he nevertheless believed that studies such as those of C.I.T.C.E. would ultimately be of great assistance to all. Meanwhile, he hoped that all present would enjoy their stay in Bavaria.

1.3

ADDRESS BY THE PRESIDENT OF THE DEUTSCHE BUNSENGESELLSCHAFT

G. M. Schwab

It is a very great honour and pleasure for me to pass on to you the greetings and the good wishes of the Deutsche Bunsengesellschaft. Our Society, in fact, feels itself very closely tied to your aims, to electrochemistry. When Ostwald and Arrhenius gave the start to physical chemistry at the beginning of this century, it was the nature of electrolyte solutions they began with. At the same time, the Bunsengesellschaft and its journal, *Zeitschrift für Elektrochemie*, were founded.

However, there is yet another reason for the sympathy between our organizations. If we plot the activities of the Bunsengesellschaft as abscissa —e.g. first the structure of matter, then thermodynamics, kinetics, etc.—a certain position will correspond to electrochemistry. On the ordinate, the activity of the Society may be plotted, to form a distribution curve. If now, in the same diagram, we also plot the activities of C.I.T.C.E., we get a high curve over the electrochemistry section. The interesting result is a considerable amount of overlapping of both integrals. This could mean repulsion in the case of symmetrical spin functions, viz. hate and concurrence! This case is precluded by the entirely different organization and working methods of your Committee. In the case of antisymmetrical spins, however, a strong attraction is the result of overlapping, and this is actually the case. How attractive electrochemistry is for the Bunsengesellschaft may be seen from the fact that our whole annual meeting in 1955 at Goslar was dedicated to the modern developments of this field. I sincerely thank you for the opportunity to take part in the serious work of your meeting, and I wish you the best success on behalf of the Deutsche Bunsengesellschaft.

1.4

REPLY BY THE PRESIDENT OF C.I.T.C.E.

T. P. Hoar

May I first on behalf of all of us, thank Prof. Lange for his kind welcome, and for his sheer hard work in organizing this meeting. No one who has not organized a scientific meeting knows quite how much detailed preparation is necessary if the meeting is to be successful. Prof. Lange has given up a great deal of his own time and thought to helping us to come together today, and he has also persuaded many other persons and organizations to help us in their several ways. To him, and to all his colleagues and associates who have so generously assisted in making this meeting possible, our very warmest thanks are due.

In reply to Mr. Mayor, I would say that we are delighted to come to his beautiful city and that we are much honoured that he has so kindly come here today to welcome us. I live on an island too and—although it is a good deal bigger than this one—I am glad to say that the traffic between us and the mainland is increasing all the time, so that the respective benefits of the island and mainland civilizations are becoming more and more available to us all.

The present Committee, meeting here, consists of representatives from many nations, and in our own field of electrochemistry we are trying to increase the collaboration that is so essential for progress. We represent a small but necessary part of science generally and we hope that our work may play some part in the increasing knowledge and technology available to mankind.

Prof. Schwab pointed out with much good humour that although the activities of the Bunsengesellschaft and C.I.T.C.E. overlap, there need be no mutual antipathy, but rather the reverse, between them. For one moment I feared he was going to make the Bunsengesellschaft a filled band and C.I.T.C.E. a narrow impurity level just above it into which Bunsengesellschaft members might be trapped with scarcely any activation. I was relieved to find that after all, his analogy was that of the mutual attraction caused by overlapping functions. We are greatly indebted to Prof. Schwab for his kind words on behalf of the venerable society of which he is President, and also for demonstrating at the very beginning of this meeting that wit has its just place in scientific deliberations.

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ADMINISTRATION