

SYMPOSIUM ON pH MEASUREMENT

FORTY-NINTH ANNUAL MEETING
AMERICAN SOCIETY FOR TESTING MATERIALS,
Buffalo, N. Y., June 24-28, 1946



Reg. U. S. Pat. Off.

Technical Publication No. 73

Price: One dollar and fifty cents

Published by the
AMERICAN SOCIETY FOR TESTING MATERIALS
1916 Race St., Philadelphia 3, Pa.

Copyright, 1947
By the
AMERICAN SOCIETY FOR TESTING MATERIALS

Printed in Philadelphia, Pa.
July, 1947

FOREWORD

The papers and discussions appearing in this volume were presented at the Fourteenth and Fifteenth Sessions of the Forty-Ninth Annual Meeting of the American Society for Testing Materials held in Buffalo, N. Y., June 27, 1946. These two sessions were sponsored by Technical Committee XIII on Hydrogen Ion Determinations of A.S.T.M. Committee E-1 on Methods of Testing, through a special symposium committee consisting of E. B. Ashcraft, Westinghouse Electric Corp., Chairman, G. A. Perley, D. S. McKinney, G. G. Manov, and F. D. Tuemmler.

The principal purpose of the Symposium is to present the latest theory and practice on colorimetric and potentiometric methods for making pH and closely related measurements.

Mr. Ashcraft and Mr. McKinney acted as technical chairmen of the morning and afternoon sessions, respectively.

**Note.—The Society is not responsible, as a body, for the statements
and opinions advanced in this publication.**

CONTENTS

	PAGE
Introduction—E. B. Ashcraft	1
Historical Review of the Hydrogen Electrode and the Calomel Cell in the Measurement of Hydrogen Ions—C. N. Myers	3
Discussion	18
Definition of pH and Extension of the Acidity Scale to Nonaqueous Systems— D. S. McKinney, Paul Fugassi, and J. C. Warner	19
Discussion	29
Standard Buffer Solutions—George G. Manov	31
Discussion	40
Recent Advances in the Theory and Use of Glass Electrodes for pH Determina- tions—Malcolm Dole	41
Discussion	55
Precautions to be Observed in Making Colorimetric pH Determinations— F. R. McCrumb	57
Discussion	63
Acid-Base Equilibria in Aqueous and Nonaqueous Solutions—Martin Kil- patrick	65
The Potentiometric Estimation of Hydrogen Ion Concentration in Nonaqueous Media—L. Lykken	71
Discussion	79