

# SYMPOSIUM ON FLAME PHOTOMETRY

---

Presented at the  
FIFTY-FOURTH ANNUAL MEETING  
AMERICAN SOCIETY FOR TESTING MATERIALS  
Atlantic City, N. J., June 19, 1951



---

*Special Technical Publication No. 116*

---

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

# SYMPOSIUM ON FLAME PHOTOMETRY

---

Presented at the  
FIFTY-FOURTH ANNUAL MEETING  
AMERICAN SOCIETY FOR TESTING MATERIALS  
Atlantic City, N. J., June 19, 1951



Reg. U. S. Pat. Off.

---

*Special Technical Publication No. 116*

---

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

---

COPYRIGHT, 1952  
BY THE  
AMERICAN SOCIETY FOR TESTING MATERIALS

---

Printed in Baltimore, Md.  
March, 1952

## FOREWORD

---

The papers and discussions in this Symposium on Flame Photometry were presented at the Sixth and the Ninth Sessions of the Fifty-fourth Annual Meeting of the American Society for Testing Materials held in Atlantic City, N. J., June 19, 1951. The Symposium was sponsored by Committee C-1 on Cement and Committee D-2 on Petroleum Products and Lubricants. L. R. Pritchard, Lone Star Cement Corp., was chairman of the Sixth Session and Chairman of the C-1 Symposium Committee, and R. O. Clark, Gulf Research and Development Co., presided over the Ninth Session and was chairman of the D-2 Symposium Committee.

---

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

---

## CONTENTS

---

	PAGE
Introduction—R. O. Clark and L. R. Pritchard.....	1
A Review of Flame Photometry—V. M. Meloche.....	3
A Stable Internal Standard Flame Photometer for Sodium, Potassium, Lithium and Calcium Analyses in Biological Fluids and a Study of Ion Interference—C. L. Fox, Jr., Elizabeth B. Freeman and Sigmund Lasker.....	13
Use of the Beckman and Perkin-Elmer Flame Photometers for the Determination of Alkalies in Portland Cement—J. J. Diamond and Leonard Bean.....	28
Applications of Flame Photometry for the Analysis of Alkalies in Silicates, Waters and Metals—J. L. Gilliland.....	33
Discussion.....	43
The Determination of Lithium Oxide in Portland Cement by Flame Photometer—W. J. McCoy and G. G. Christiansen.....	44
Discussion.....	50
Control of Interferences Caused by Acids and Salts in the Flame Photometric Determination of Sodium and Potassium—Frank T. Eggertsen, Garrard Wyld, and Louis Lykken.....	52
Discussion.....	66
The Effect of Organic Solvents on the Flame Photometric Emission of Certain Elements—G. W. Curtis, H. E. Knauer and L. E. Hunter.....	67
Discussion.....	75
Determination of Tetraethyllead in Gasoline by Flame Photometry—P. T. Gilbert, Jr.....	77
Discussion.....	90
Determination of Calcium in Lubricating Oil by Flame Spectrophotometer—M. L. Moberg, V. B. Waithman, W. H. Ellis and H. D. DuBois.....	92
Discussion.....	94
A Modified Recording Flame Photometer—W. H. King and William Priestley, Jr... ..	97
Discussion.....	104
Flame Photometer in the Analysis of Water and Water-Formed Deposits—R. K. Scott, V. M. Marcy and J. J. Hronas.....	105
Discussion.....	115
General Discussion.....	117

**THIS PUBLICATION** is one of many issued by the American Society for Testing Materials in connection with its work of promoting knowledge of the properties of materials and developing standard specifications and tests for materials. Over the years the Society has published many technical symposiums, reports, and special books. These may consist of a series of technical papers, reports by the A.S.T.M. technical committees, or compilations of data developed in special Society groups with many organizations co-operating. A list of A.S.T.M. publications and information on the work of the Society will be furnished on request.