
Symposium on
COMPOSITION OF PETROLEUM OILS



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

ASTM Special Technical Publication No. 224

SYMPOSIUM ON COMPOSITION OF PETROLEUM OILS, DETERMINATION AND EVALUATION

Sponsored By
RESEARCH DIVISION IV ON HYDROCARBON ANALYSIS
OF ASTM COMMITTEE D-2 ON PETROLEUM PRODUCTS AND LUBRICANTS

Held at
New Orleans, La., February 8 and 9, 1957



Reg. U. S. Pat. Off.

ASTM Special Technical Publication No. 224

Price \$5.50; to Members \$4.40

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

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

© BY AMERICAN SOCIETY FOR TESTING MATERIALS 1958

CONTENTS

	PAGE
Preface—Harold M. Smith.....	1
Introductory Remarks—R. A. Klett.....	5
SEPARATION—SESSION I	
Introduction—W. E. Seovill.....	7
Volatility and Adsorption	
Summary of Work of the API Project 6 on the Hydrocarbons in the C ₁₃ to C ₃₈	
Fraction of Petroleum—Beveridge J. Mair and Frederick D. Rossini....	9
Discussion.....	46
Determination of the Paraffin, Monocyclic and Dicyclic Naphthene Contents	
of a Middle East Gas Oil by Selective Adsorption—H. C. Rampton.....	49
Composition of an East Texas Lubricating Oil Distillate—B. A. Orkin, J. G.	
Bendoraitis, B. Brown, and R. H. Williams.....	59
Discussion.....	80
Thermal Diffusion	
New Thermal Diffusion Techniques Applicable to High-Boiling Petroleum	
Fractions—A. L. Jones.....	83
The Separation of High-Boiling Petroleum Oils by Thermal Diffusion—F. W.	
Melpolder, R. W. Sauer, and T. A. Washall.....	94
Joint Discussion.....	105
Solvent Extraction	
Solution Behavior Patterns as Supplement in Analysis of Oil Fractions—E. L.	
Derr, C. H. Deal, and G. J. Pierotti.....	111
Discussion.....	124
SPECTROSCOPIC METHODS—SESSION II	
Introduction—E. J. Rosenbaum.....	125
Infrared	
Determination of Methyl, Methylene, and Alkyl Benzene Group Types by	
Infrared Absorption—R. H. Hughes and R. J. Martin.....	127
Discussion.....	149
Mass Spectrometry	
Analysis of Petroleum Oils by Mass Spectrometry—E. G. Carlson and M. J.	
O'Neal.....	151
Discussion.....	167
Nuclear Magnetic Resonance	
Characterization of Hydrocarbons in Petroleum by Nuclear Magnetic	
Resonance Spectrometry—R. B. Williams.....	168
The Influence of Intermolecular Interactions on Nuclear Magnetic Resonance	
Chemical Shift Measurements as Related to Certain High Molecular	
Weight Hydrocarbon Systems—J. R. Zimmerman and J. A. Lasater....	195
Joint Discussion.....	204
GENERAL METHODS AND CORRELATIONS—SESSION III	
Introduction—R. L. LeTourneau.....	211
Chemical Treating	
The Composition of Petroleum Distillates as Revealed by Their Sulfonates—	
A. B. Brown and J. O. Knobloch.....	213
Discussion.....	227

continued on next page

CONTENTS—*Continued*

Adsorption and Physical Property Method—W. J. Stout, R. W. King, M. E. Peterkin, and S. S. Kurtz, Jr.....	230
Discussion.....	247
Comparison of Structural Group Analyses by Spectrometric and Physical Property Methods—S. H. Hastings, B. H. Johnson, H. E. Lumpkin, and R. B. Williams.....	250
Discussion.....	263
Molecular Weight Determination—F. H. Stross.....	265
Discussion.....	273
A Correlative Method for Structure of Solid Saturated Hydrocarbons—G. G. Rumberger and R. W. Dannenbrink.....	275
Discussion.....	283
General Discussion.....	284

