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978-1-107-68731-8 - Technical Handbook of Oils, Fats and Waxes: With 33 Illustration and
36 Plates: Volume I: Chemical and General

Percival J. Fryer and Frank E. Weston

Frontmatter

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TECHNICAL HANDBOOK
OF
OILS, FATS AND WAXES
VOLUME I
Chemical and General

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TECHNICAL HANDBOOK OF OILS, FATS AND WAXES

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WITH 33 ILLUSTRATIONS AND 36 PLATES

VOLUME I

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PREFACE

THE present small treatise has been designed primarily, as its title indicates, to meet the need of the technical worker, the works chemist, and others less directly concerned in the technology of the oils, fats and waxes.

It has been the experience of the authors, extending over several years, that, in the case of technical men generally, there exists a wide knowledge of the practical issues of the subject concerned, side by side with much ignorance of the basic principles underlying such issues. In the following pages an endeavour has been made to explain in as simple a manner as possible the theoretical basis upon which the technical processes rest, as well as to describe the various reactions concerning the industry. Such explanations have been mostly printed in specially small type, so that in the case—doubtless of frequent occurrence—of such matter being already familiar, it may be readily passed over by the reader.

For the first time, we believe, a survey has been made of the whole subject of the oils, fats and waxes in a single treatise. An obvious advantage of this is the wider outlook so obtained, and the possibility of comparing within the limits of the one volume, the “natural” oils and fats with the mineral or hydrocarbon oils, and the “natural” waxes with those of mineral origin.

No attempt has been made to give an exhaustive account of the historical aspect of the various operations and of analytical procedure. If this is desired the reader must consult larger treatises.

The aim, on the contrary, has been to eliminate all matter, the omission of which is compatible with an adequate knowledge of the present-day methods of production, and of analytical control.

The authors have endeavoured to employ as far as possible, a style direct and succinct, and have made use of a special type to indicate at a glance the subject matter of each paragraph. They believe that in this way it has been possible so to minimise the space required as to obtain a volume of convenient size for handling, and adequate in all respects except for academic purposes.

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[More information](#)

vi

PREFACE

A special feature is the coloured diagrams of the more important analytical determinations. Used in the manner indicated the authors trust that these may prove of value, in particular to the works chemist.

Where possible in the detailed descriptions of individual oils and fats, a series of figures has been given showing (1) the average values (2) the normal variations, and (3) the outside limits recorded for the various analytical data. In the latter case, the authorities responsible for the figures are stated; in the case of the other two series of figures, these have been compiled by a careful comparison of results obtained, in many cases, by the authors, with those published by other chemists.

A companion volume on the practical analytical work referred to in various places in the book is in course of preparation and will shortly be published.

Acknowledgment must in general be made to such works as the now classical treatise on oils and fats by the late Dr Lewkowitsch¹, and to a less extent to other original papers and productions. The figures for the Refractive Indices are mainly those published by Messrs Bolton and Revis². We have to thank Messrs Archbutt and Deeley³, and their publishers, for permission to print the table of *Viscosities of Glycerine Solutions*. The following firms have kindly placed at our disposal the plates for reproducing many of the illustrations of technical apparatus: Messrs Rose, Downs and Thompson, Messrs Greenwood and Batley, Messrs S. H. Johnson. Our thanks are also due to Mr A. F. Fryer, M.Sc., F.I.C., who kindly consented to finally revise the proofs. For the rest, the authors trust that a practical acquaintance with works processes and of analytical methods extending over a number of years may prove to be of value and service to those engaged in this most interesting and important branch of chemical industry.

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January 1917.

¹ *Chemical Technology and Analysis of Oils, Fats and Waxes*. Dr Julius Lewkowitsch. 5th edition. Macmillan. 3 vols.

² *Fatty foods*. Bolton and Revis. Churchill.

³ *Lubrication and Lubricants*. Archbutt and Deeley. C. Griffin and Co.

CONTENTS

	PAGE
PREFACE	v
SECTION I	
INTRODUCTION	1
SECTION II	
CHEMISTRY OF THE OILS, FATS AND WAXES	5
CHAP.	
I. Fatty oils, fats and waxes	5
II. Mineral oils and waxes	18
III. Saponification products of oils, fats and waxes	29
SECTION III	
TESTING AND ANALYSIS OF OILS, FATS AND WAXES	64
IV. Physical methods	67
V. Chemical methods	77
SECTION IV	
CLASSIFICATION OF OILS, FATS AND WAXES	91
(A) Glycerides.	
(i) Liquids.	
VI. Marine oils	96
VII. Vegetable drying oils	111
VIII. Vegetable semi-drying oils	125
IX. Vegetable non-drying oils	133
X. Animal oils	145

CHAP.	PAGE
(A) Glycerides (<i>continued</i>).	
(ii) Solids.	
XI. Vegetable fats	149
XII. Animal fats	163
(B) Non-Glycerides.	
(A) SAPONIFIABLE.	
(i) Liquids.	
XIII. Waxes ("Sperm oils")	177
(ii) Solids.	
XIV. Natural waxes (alcoholic)	181
XV. Bitumen waxes (non-alcoholic)	189
(B) UNSAPONIFIABLE.	
(i) Liquids.	
XVI. Mineral oils	193
(ii) Solids.	
XVII. Mineral waxes	205
SECTION V	
PRODUCTION AND REFINEMENT OF OILS, FATS AND WAXES	209
XVIII. Production of fatty oils and waxes	209
XIX. Refinement of fatty oils and waxes	217
XX. Hydrogenation of fatty oils	225
XXI. Mineral oils and waxes	234
SECTION VI	
OLEO-RESINS AND ESSENTIAL OILS	251
XXII. Turpentine and its substitutes	251
XXIII. Rosin	255
PLATES I—XXXVI	<i>Between pp. 258 and 259</i>
TABLES I—VIII	259
INDEX	269
TABLES OF ANALYTICAL CONSTANTS	<i>See p. x</i>

LIST OF PLATES

PLATE	
I.	Steam-jacketted mixing pan.
II.	Digester.
III.	Section showing modern arrangements for dealing with seed preparatory to crushing.
IV.	Plan of "Anglo-Premier" mill for oil seeds requiring twice pressing.
V.	"Colonial" mill for crushing seeds requiring only once pressing.
VI.	Small self-contained Anglo-American oil mill.
VII.	Decortication of castor and cotton seeds.
VIII.	Rotary separator.
IX.	Screen for cleansing seeds.
X.	Cotton-seed delinter.
XI.	Castor-seed decorticator and separator.
XII.	Decorticator for cotton-seed.
XIII.	Reducing mill for coconut and copra.
XIV.	Bone-crushing mill.
XV.	Edge runners.
XVI.	Anglo-American seed crushing rolls.
XVII.	Anglo-American kettle and moulding machine.
XVIII.	Hydraulic cake-forming and moulding machine.
XIX.	Anglo-American hydraulic press. Type 1.
XX.	Anglo-American hydraulic press. Type 2.
XXI.	Specimens of cake brands used in Anglo-American mills.
XXII.	"Premier" oil press.
XXIII.	Cage finishing press.
XXIV.	Hydraulic pump.
XXV.	High, intermediate and low pressure accumulators.
XXVI.	Set of triple pressure distribution valves.
XXVII.	Anglo-American cake paring machine.
XXVIII.	Ground plan of solvent-extraction plant.
XXIX.	Cross section of solvent-extraction plant.
XXX.	View of an extraction plant.
XXXI.	Section of cotton-seed oil refinery.
XXXII.	Laboratory filter press.
XXXIII.	24-plate filter press for oils.
XXXIV.	Filter press for oils with self-contained electrically-driven pump.
XXXV.	Fullers' earth refining plant for oils.
XXXVI.	Types of filter plates.

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Frontmatter

[More information](#)

TABLES OF ANALYTICAL CONSTANTS

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TABLE		<i>Between pp.</i>
I.	Specific gravities at 15.5° C.	68—69
II.	Titer Test. Solidifying points of mixed fatty-acids of oils	70—71
III.	Refractive indices—readings of Butyro-refractometer	72—73
IV.	Iodine values	80—81
V.	Bromine thermal test—degrees rise in temperature (C.)	82—83
VI.	Saponification values	84—85

NOTES ON THE USE OF THE TABLES

Each table has a **reference line**, marked off in divisions corresponding to equal fractions of the various values. Opposite to these are placed *sections* hatched in colours to represent the various classes of oils, fats and waxes. The length of these sections indicates the **extreme variations** of each individual oil, etc. The line connecting each section with its corresponding name is placed in the position of the **average value** for each substance.

It is suggested that the tables may be used in the following manner:— In order to identify an unknown oil, fat, or wax, the various values are obtained by analysis, and a rule or straight-edge is placed horizontally at these particular positions on the reference line, when *the sections which appear cut* by the straight-edge represent those oils, etc. which come within possible range of consideration. Further, the coloured line (connecting with the names of the oils, fats, etc.) which is nearest to the straight-edge will indicate the most probable one, since it approaches most closely to the average value for this particular oil, fat, or wax.

Using the tables in succession—commencing preferably with the **iodine value**—and assuming only a single oil, fat, or wax to be present, the correct result can be rapidly obtained, since all other possibilities are automatically eliminated. Thus, if on reference to the table for iodine values the straight-edge intersects say four oils, etc., two of these may be above or below the straight-edge in (for example) the specific gravity table, and of the two remaining possibilities, one may be eliminated on reference to the table of saponification values.

In the case of mixtures of oils, fats and waxes, the problem of identification is a much more complex one, but the tables will still be found helpful in arriving at the correct solution.

In addition to their use for analytical determinations, the tables are also intended to have an educational value to the student. For this purpose, they will repay careful study. When the particular oil, fat or wax is under consideration, its relative position on each of the tables should be noted, and, in this way, a clear conception will readily be obtained of its distinctive features and of its class relationships.

A glance at one of the tables will also serve to show whether that particular test is of service in discriminating a given oil, etc., from any other oil, and thus save the labour of having to refer to the separate descriptions of individual oils.

ERRATA

- Table of Specific Gravities (between pp. 68 and 69)—
Cod Liver Oil. Average value should read .925.
Lard. For .931 read .936 and the hatched bar at 934—938
(not .931—932).
- Table of Iodine Values (between pp. 80 and 81)—
Neat's Foot Oil, should read 69—72, average value 70.
Palm Kernel. Hatched section omitted should read 10—17.
- Table of Bromine Thermal Test (between pp. 82 and 83)—
Neat's Foot Oil should read 12—13, average value 12.7.