

**A SHORT
HAND-BOOK OF
OIL ANALYSIS**

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A Short Hand-Book of Oil Analysis by Augustus H. Gill

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AUGUSTUS H. GILL

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of
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BY

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REVISED NINTH EDITION



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Samuel G. Harmon

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PREFACE TO THE NINTH EDITION

THE changes in this edition embrace a description of the new MacMichael viscosimeter, and a means of the reduction of viscosimetrical readings to absolute units or poises. One or two minor tests for lubricating oils have been added. The special tests, methods of analysis and the description of the special oils and greases have been revised where necessary, particularly in the case of the drying oils, and the methods of the analysis of cutting and sulphonated, fats and oils included, so as to bring the book thoroughly up-to-date.

CAMBRIDGE, MAY, 1919.

PREFACE TO THE FIRST EDITION.

THIS little book was written primarily to meet the needs of the author's own classes. It is given to the public in the belief that there is a demand for a concise manual for the analysis of oils, which shall give the methods of applying the usual physical and chemical tests to the mineral as well as to the animal and vegetable oils.

It is not designed to take the place of any of the existing books, but rather to serve as an introduction to them, more especially to Benedikt-Lewkowitzsch, which is to the oil chemist what Fresenius is to the analytical chemist, and to which the writer wishes to express his own indebtedness. The writings of Schaedler, Redwood, Allen, and Brannt have also been freely consulted. Only the more commonly occurring oils are discussed, and these as regards their preparation, properties, analytical constants,—the highest, lowest, and average being given,—and finally their uses and adulterants.

In the use of this book it is assumed that the student is thoroughly familiar with the usual operations of volumetric and gravimetric analysis, and has attained some proficiency in organic chemistry.

Acknowledgments are due to Mrs. Ellen H. Richards for hints and suggestions, and to Mr. William L. Root for assistance in reading the proof.

BOSTON, November, 1897.

PRELIMINARY OBSERVATIONS.

SAMPLES of oil are almost always handled in the trade, and frequently brought for analysis, in a four-ounce "oil vial." The student will pour out a portion from the quart can, after thorough shaking, into such a vial. Before proceeding with the tests to be later described, it is well to make certain preliminary observations upon this sample.

The *turbidity*, showing the presence of water or of oils which imperfectly mix, and the *sediment*, either *stearin* or dirt, are to be noted; the *color* and *fluorescence*, or "bloom,"—the latter indicating the presence of mineral oils,—are next observed; the color varies from "water white," through straw, lemon-yellow, wine-red, or the oil may be opaque.

The *odor* and *taste* may reveal to experts much concerning the source of the oil under examination; for example, the fish oils, especially when warmed, have an unmistakable odor, and the presence of whale oil in sperm is often detected by its "nutty" taste.

By inverting the bottle when partially filled, and noting the way in which the oil runs off from the bottom and the number of drops, an approximate idea of the viscosity may be obtained.

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