ALCOHOLOMETRIC TABLES

Published @ 2017 Trieste Publishing Pty Ltd

ISBN 9780649431915

Alcoholometric Tables by Sir Edward Thorpe

Edited by Trieste Publishing Pty Ltd.
Cover @ 2017

www.triestepublishing.com

SIR EDWARD THORPE

ALCOHOLOMETRIC TABLES

Trieste

ALCOHOLOMETRIC TABLES

ALCOHOLOMETRIC TABLES

BY

SIR EDWARD THORPE, C.B., LL.D., F.R.S.

LATE PRINCIPAL OF THE GOVERNMENT LABORATORY, AND EMERITUS PROFESSOR OF CHEMISTRY, IMPERIAL COLLEGE OF SCIENCE AND TECHNOLOGY, SOUTH KENSINGTON, LONDON

LONGMANS, GREEN AND CO.
39 PATERNOSTER ROW, LONDON
FOURTH AVENUE & 30TH STREET, NEW YORK
BOMBAY, CALCUTTA, AND MADRAS
1915

INTRODUCTION.

THE accompanying tables were compiled under my direction by Mr. T. J. Cheater and Mr. John Holmes, of the Government Laboratory, and were originally published in an abbreviated form in connexion with the article "Alcoholometry," contributed by Mr. Holmes to "A Dictionary of Applied Chemistry" (Longmans, Green & Co., London). They have now been extended so as to make them more convenient in practical application.

The following general observations on alcoholometry, together with the explanation of the origin and use of the tables, are taken from the article above referred to.

When alcohol and water are mixed together the volume of the mixture is invariably less than the sum of the initial volumes, and the degree of contraction varies with the proportion of alcohol present. In countries in which the revenue from spirit is of great importance it has therefore been found necessary to ascertain by experiment the specific gravities of mixtures of alcohol and water in all proportions and at various temperatures. These experiments have in general been carried out at the request of the governments interested, and the results are embodied in tables associated with the names of those entrusted with the investigations.

In 1794 Sir Charles Blagden and Mr. Gilpin completed an extensive series of experiments, undertaken at the request of the British Government ("Phil. Trans.," 1790-4), the results of which have since served as the basis of systems of alcoholometry in this and other countries. At that time anhydrous alcohol had not been prepared, Blagden and Gilpin's tables having reference to spirit of a specific gravity 0·825 at 15·6°/15·6° C. (60°/60° F.). Tralles, in 1811, conducted a like investigation for the Prussian Government ("Gilb. Ann.," 1811), and adopted 0·7946 as the specific gravity of alcohol at 15·6°/15·6° C. He incidentally confirmed the general accuracy of the results of Blagden and Gilpin, and constructed tables of spirit-strengths which for upwards of sixty years formed the basis of German alcoholometry. Similar researches were undertaken by Gay-Lussac (Paris, 1824), McCulloch (Washington, 1848), Baumhauer (Amsterdam, 1860) Mendeléeff (Petrograd, 1865), and more recently by the Kaiserliche Normal Eichungs Kommission (Berlin, 1889), the several results of which have from time to time been incorporated in the systems of alcoholometry adopted by the respective governments. The unofficial investigations of Fownes ("Phil. Trans.," 1847), Drinkwater ("Chem. Soc. Mem.," 1848), and Squibb ("Ephemeris," 1884), are likewise entitled to consideration.

Drinkwater prepared alcohol of a specific gravity 0·79381 at 15·6°/15·6° C. (in air), whilst Squibb obtained it as low as 0·7935, but this result lacks confirmation.

The work of Mendeléeff for the Russian Government admittedly constitutes the most comprehensive and

exact of the researches hitherto made in the field of alcoholometry. Mendeléeff obtained alcohol of a specific gravity 0·79425 at 15°/15° C., which at 15·6°/15·6° C. is equivalent to 0·79384 in a vacuum, or to 0·79359 in air, and he assigned to Drinkwater's alcohol an alcoholic content of 99·95 per cent, and to the strong spirit of Blagden and Gilpin 89·06 per cent by weight. The results of Tralles' and Gay-Lussac's experiments, being based on alcohol less dehydrated than that of Drinkwater, compare less favourably with those of Mendeléeff.

Mendeléeff was so well satisfied with the work of Blagden and Gilpin, and Drinkwater, that, for spirituous mixtures of low strength, he included many of their results in his tables of spirit-densities, and after a critical investigation and subsequent verification by the Kaiserliche Normal Eichungs Kommission, his results have been substantially adopted as the basis of the present system of German alcoholometry in place of the relatively less accurate data of Tralles.

The results of the work of these four authorities have been incorporated in the accompanying table of spirit-densities, which may serve for the pyknometrical determination of the true strength of spirits.

In the assessment of duty and in commercial transactions, the standard of strength is termed "proof". Spirit of proof strength is defined as "that which at the temperature of 51° F. (10·6° C.) weighs exactly $\frac{12}{13}$ths of an equal measure of distilled water" also at 10·6° C. According to the best available data this mixture of alcohol and water has a specific gravity of 0·91976 at 15·6°/15·6° C., and contains 49·28 per cent by weight