

SYMPOSIUM ON FLAME PHOTOMETRY

INTRODUCTION

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The principle of flame photometry has been known for many years. However, the practical use of this principle has increased during the past few years as a result of the production of commercially available flame photometers. The analytical chemist has always been faced with a long, tedious method of chemical analysis for sodium, potassium, lithium, calcium, and magnesium. During the recent war years, the need for quick, accurate analyses of small amounts of sodium and potassium in blood probably accelerated the work of developing a flame photometer which could meet these specification requirements.

Realizing that the flame photometer had certain inherent limitations, members of Committee C-1 on Cement investigated the possible application of this instrument to the determination of sodium and potassium in portland cement. A method of analysis was developed, using a commercial flame photometer, which gave accuracies within the limits set up by the ASTM Methods of Chemical Analysis of Portland Cement (C 114 - 47).³ A tentative method of flame photometric test for Na₂O and K₂O in portland cement was adopted by the Society at the Annual Meeting in June 1949 and designated (C 228 - 49 T).⁴ This tentative method

has facilitated and accelerated many research programs on the effect of sodium oxide and potassium oxide on cement and concrete. However, new and improved test methods have to be devised to keep abreast of new developments.

The members of Committee C-1 and of Committee D-2 on Petroleum Products and Lubricants are all aware of the importance to industry of testing methods. Accordingly, they arranged a symposium devoted entirely to methods of analysis by flame photometry so that information on new testing methods would be available. Because the use of the flame photometer in testing methods is rather new, it was felt that all members of these committees would be interested in hearing papers devoted to the fundamentals and limitations of the flame photometer and to its specific applications in these committees' respective fields.

The opening paper of the symposium, therefore, covered the review and prospect of flame photometry. The second paper—an original, fundamental development—dealt with the medical profession's use of the flame photometer for chemical analysis of biological fluids. The three papers in the next group described the use of the flame photometer in the cement and materials testing fields.

The second session of the symposium was devoted primarily to the application of flame photometry to petroleum products and lubricants. The fluid nature of many of these products permits direct

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³ 1949 Book of ASTM Standards, Part 3, p. 38.

⁴ Tentative Method of Test for Sodium Oxide and Potassium Oxide in Portland Cement by Flame Photometry (C 228 - 49 T), 1949 Book of ASTM Standards, Part 3, p. 133.

atomization, thereby reducing materially the time of analysis through elimination of preliminary operations. This technique, considered by three authors of the symposium, has proven extremely valuable for control laboratory work and probably will represent one of the major interests in future developments within the petroleum industry.

To round out the program, Committee D-19 on Industrial Waters sponsored the

paper on the application of the flame photometer to water analysis. The symposium committee thought the inclusion of such a paper would be of interest not only to the cement and petroleum people, but to industry in general by virtue of their dependence upon water for the successful operation and maintenance of commercial processes, and would simultaneously help to illustrate the flexibility of the flame photometer technique.