

installing an acetylene plant, its cost, cost of the light as compared with other artificial illuminants, etc.

The volume is well printed and abundantly illustrated.

E. G. LOVE.

A SHORT COURSE IN INORGANIC QUALITATIVE ANALYSIS FOR ENGINEERING STUDENTS. By J. S. C. WELLS, Instructor in Analytical Chemistry, Columbia University. New York: John Wiley & Sons. 1898. vi + 294 pp.

The author of this book aims, according to the preface, to give a short but thorough course in qualitative analysis for the use of students who have only a limited time to devote to the subject.

This statement, which is frequently repeated in substance in the prefaces to laboratory manuals, and which often denotes a want of completeness in the treatment of the subject, cannot be so understood in the case of the present work.

Beginning with an excellent chapter upon reactions and the use of formulas in general, the author discusses the properties and behavior of bases towards reagents in a thoroughly satisfactory manner. Many chemical facts of general interest are interspersed throughout the book, serving to illustrate the importance of a knowledge of the reactions taught by qualitative analysis.

Equations are used more freely than in some of the larger works and will supply in advance answers to many of a student's questions. The methods directed for use in the separation of the bases of a group are, in the main, those of Fresenius, although modifications are here and there suggested which are undoubtedly to be looked upon as an advance. In his treatment of the separations of acids the author has given some good methods.

In all cases the schemes for separations are presented in the form of tables supplemented by full and detailed explanatory notes. In the part devoted to the analysis of complex mixtures the student receives many useful suggestions. A short chapter upon reagents closes the book.

Altogether, it is quite evident that, in spite of the author's modest limitation of the use of the book to engineering students, it will find a much wider use. The accuracy of treatment and completeness of detail will commend its use both to teacher and student.

F. C. PHILLIPS.