

**LABORATORY MANUAL
OF ELEMENTARY
COLLOID CHEMISTRY**

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Laboratory Manual of Elementary Colloid Chemistry by Emil Hatschek

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PREFACE.

ALTHOUGH most of the existing text-books of Colloid Chemistry necessarily give, in more or less detail, descriptions of experimental procedure and instructions for making many of the classical preparations, no laboratory manual or collection of practical exercises such as has been found indispensable in the teaching of other branches of chemistry has so far appeared. The lack of such a work is all the more likely to check the spread of a practical knowledge of the discipline, as many of the methods and materials of colloid chemistry are peculiar, and strange even to students well trained in inorganic and organic chemistry.

The present work is an attempt to fill this gap and to supply accurate and very detailed directions for carrying out the fundamental operations, for making a number of representative preparations, and for examining them by the standard methods. These are based throughout on personal experience of the processes described and of the difficulties experienced in teaching them. The examples chosen are, generally speaking, the simplest ones and, where alternatives are possible, those involving the smallest expenditure in apparatus and material. The task of selection has not been easy, and the attempt to delimit the elementary region of the whole domain may seem premature or arbitrary: the guiding principle has been to provide for the wants of those students of numerous branches of science who are finding some training in colloid chemistry an indispensable part of their equipment, and are able to devote a limited time only to acquiring its technique.

For the guidance of readers desirous of going beyond the limits of this manual a number of references to recent literature are given at the end of each section. The papers quoted are mostly records of experimental investigations which are either alternative to, or more advanced than, the examples given in the text.

Since the book is the first of its kind, the author will be very grateful for hints from readers who may find any of the directions given in it lacking in clearness or capable of being simplified.

EMIL HATSCHKE.

LONDON,
February, 1920.

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A LABORATORY MANUAL OF ELEMENTARY COLLOID CHEMISTRY.

CHAPTER I.

GENERAL REMARKS ON APPARATUS, MATERIALS AND PROCEDURE.

THE apparatus employed in the operations to be described is, with very few exceptions, that available in any chemical laboratory. Glass vessels used for preparative work should, if possible, be of resistance glass; this applies even to test tubes used for such work as experiments on electrolyte coagulation. Test tubes which turn distilled water containing a little phenolphthalein pink in a very short time are by no means uncommon, and should not be used for any purpose. As regards the choice of larger vessels, it should be remembered that very thorough cleaning is necessary, and that in many cases undue exposure of solutions to air is undesirable, so that the choice will fall on tall cylindrical beakers, conical beakers with spout, or Erlenmeyer flasks. Flasks with narrow necks are, generally speaking, undesirable.

Vessels should be cleaned immediately after use, in any event, and again before use in the case of sensitive preparations. The methods to be adopted in the former case naturally depend to a great degree on the previous contents of the vessel. Suspensoid sols are, of course, easily washed off, although in