

CHEMISTRY FOR SCHOOLS

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Chemistry for schools by G. K. Mills

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G. K. MILLS

**CHEMISTRY
FOR SCHOOLS**

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CHEMISTRY FOR SCHOOLS

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PREFACE

DURING the last decade an animated discussion has been carried on in the scientific literature as to the proper place of the atomic and molecular hypotheses in chemistry; and the conviction is rapidly gaining ground that these hypotheses should be excluded altogether from the earlier stages of instruction and should be introduced only after the pupil has acquired familiarity with the fundamental conceptions and quantitative laws of the science. In this way only is it possible to achieve that distinction between fact and hypothesis so long recognized as necessary to clear thinking.

Some time ago Messrs. Gage and Company asked us to prepare a book on chemistry treated from this point of view. We felt ourselves unable to comply; we were unwilling to be financially interested in a book, the very necessity of which might be, or might seem to be, traceable to ourselves, that is, to new methods of treatment or new branches of chemistry recommended by us for the curriculum.

When, however, Mr. Mills had prepared the manuscript for a text-book and asked us to revise it, then, since we have a great interest in the teaching of chemistry in the schools of Ontario, we could not refuse his request, and have accordingly done our best, in the limited time at our disposal, by revising and rearranging the subject matter, to bring the book into accord with modern views and to reduce the hypothetical element to a minimum.

F. B. ALLAN,
FRANK B. KENRICK,
W. LASH MILLER.

UNIVERSITY OF TORONTO,
September, 1906.



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CHAPTER I.—REACTIONS

SUBSTANCES.

OBJECTS about us are distinguishable because of their properties, such as form, size, hardness, color, odor, taste, density, combustibility, solubility, etc. All of these properties, however, are not of equal interest to the chemist, who concerns himself mainly with those which are not affected by changing the size or form of the object. Tables, chairs, and doors, for instance, have each a definite form, by which we recognize and distinguish them; while with respect to their other properties, density, combustibility, etc., they are the same; if broken to pieces the size and form are altered, while the others remain unchanged. These objects are therefore said to consist of the same "substance," namely, wood. Similarly, if a knife blade, or a window pane, be broken, the "substance" of which each is composed—steel or glass—remains unaltered.

Properties of a Substance.

SUPPLIES: Piece of roll sulphur, graduate, dry cell, electric bell, test tube, carbon disulphide, evaporating dish, lamp, silver coin.

Experiments:

1. Examine a piece of roll sulphur and note its color, its lustre; test its hardness by scratching it with a knife.