

PREFACE

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some other purpose, reference should be made to the notes, or the whole repeated, but with the new requirement as the object.

4. The notes that record the conditions of the experiment and the phenomena observed should be written by the pupils themselves, at the time of making the experiment, and without dictation or suggestion from the teacher. The note-book should be a register of the student's experiences, and entries should be made in it while the matters being described are still fresh in mind.

The value of an experiment is only slightly in the doing of it, mainly its worth lies in the discussion of the observations. The questions that accompany the directions for the experiments in the book are intended to be only suggestive, for such questions must of necessity be general in their character. The teacher should, therefore, take up the consideration of the problem from the point of view of the pupils' requirements and experiences as shown in what they have derived from the work done.

It is believed that most pupils taking this Middle School Course will get no further instruction in Chemistry; hence an effort has been made to connect this particular school work with the activities of life. This should be one of the main vitalising elements of the subject, and no opportunity should be missed of emphasising such relationships and applications, especially in connection with local conditions and industries. While these are important in their way, neither the commercial aspect of the study, nor mere knowledge of the details of the science, should be permitted to displace the effort to develop that attitude of mind which causes the pupil to observe accurately, to take account of essential conditions, and to draw proper inferences from them.

The sign of equality used to express chemical action has been, at times, replaced by an arrowhead. The latter is now a recognised symbol of chemical notation; students, therefore, should be familiar with its use. In this book it is employed in cases in which emphasis is directed to changes in substances rather than to equality of masses. If any excuse were required for its introduction, a sufficient one would be found in its common use to express reversible reactions.