CHEMICAL EXPERIMENTS

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PREPARED TO ACCOMPANY REMSEN'S "INTRODUCTION TO THE STUDY OF CHEMISTRY"

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PREFACE.

THIS book has been prepared for use as a laboratory guide to accompany the study of Remsen's "Introduction to the Study of Chemistry." The experiments included in the course are essentially those in the last edition of the "Introduction." Minor changes have been made in many of them; essential changes in a few. If the directions are followed, the average student will experience no difficulty in carrying them out successfully.

The numbering of the experiments in the "Introduction" has been followed in this book; additional experiments have been inserted, and designated as "15*a*," "25*a*," "25*b*," etc. In the latter class will be found a small number of experiments not contained in the "Introduction," but which have been inserted here in accordance with the recommendation of the Committee on Secondary School Studies, whose report was published by the United States Bureau of Education in 1893. As many of the experiments there recommended have been inserted as seemed to the authors to be of advantage to the student following this course, the time at disposal and the facilities of the average laboratory being taken into account.

In some cases it may be that in laboratories not completely equipped fairly satisfactory results may be obtained with simpler apparatus. The effort has, however, been made in this book to omit everything

which does not serve to insure the success of the experimental work.

It has seemed best to include all the experiments contained in Remsen's "Introduction to the Study of Chemistry." There are, however, a number of these which are not suited to general laboratory practice: they should be reserved for the lecture-room, or at most performed only with the assistance of a competent teacher. In this University the experiments in the "Introduction" usually omitted from the general laboratory course are Nos. 4, 25, 26, 28, 34, 43, 45, 47, 48, 56.

As many as possible of those omitted should be performed by the teacher in the presence of the class; and the points of importance should be drawn out by questions. Afterwards the pupils should write a full account of what they have seen, and draw such conclusions as the experiments may lead to.

THE AUTHORS.

BALTIMORE, September, 1895.

LIST OF EXPERIMENTS.

1. Physical and chemical change.
2. Heat " " "
3. " " " "
4. The electric current and chemical change.
5. Manipulation of gases.
6. " " "
7. Mechanical mixture: recognition of ingredients.
8. " " separation " "
9. " " " " "
10. " " conversion by heat into a chemical compound.
11. Contact and chemical change.
12. " " " "
13. " " " "
14. " " " "
15. " " " "
15a. Oxygen: from mercuric oxide.
16. " " potassium chlorate.
17. " " manganese dioxide.
18. " " potassium chlorate and manganese dioxide.
19. Physical properties of oxygen.
20. Action of oxygen at ordinary temperature.
21. " " " on sulphur at high temperatures.
22. " " " " carbon " " "
23. " " " " phosphorus " "
24. " " " " steel at " "
25. Absorption of oxygen by iron at " "
25a. Oxidation in the air.
25b. " " " "
26. Hydrogen: electrolysis of water.
27. " action of sodium on water.
28. " " " iron " "
29. " " " zinc on acids.
30. Products of the action of zinc on acids.