THE CHEMISTRY AND LITERATURE OF BERYLLIUM

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PREFACE.

This book is written with the main object in view of saving preliminary study and labor to future investigators of beryllium and to point out some of the peculiarities of this interesting element which are apt to lead the novitiate toward erroneous conclusions. Especially is it desired to call attention to the fact that a large proportion of its accredited compounds are in reality but indefinite solid solutions. This condition of the literature of beryllium is due to the abnormal extent to which its hydroxide is soluble in solutions of its normal salts, giving rise to solids of almost any degree of basicity or to solutions with decreased osmotic effects. Accordingly, results of analysis, freezing points, etc., give little evidence of the true nature of its compounds, unless accompanied by proved definiteness of composition, a proof too often omitted throughout the whole field of inorganic chemistry, but nowhere more than in studying beryllium and its compounds.

More labor has been expended upon the bibliography than its limited extent may seem to indicate. It is believed that it will be found to contain references to all or nearly all the original articles on beryllium and that the references to abstracts will also be found fairly complete through 1902. Since 1902 the original articles and chief abstracts have alone been entered. It has been deemed advisable to include a brief abstract, at times critical in tone, of each article, but it is not claimed that these abstracts always cover the full subject matter of the original, although nothing important is intentionally omitted.

The Journals examined are approximately the same as those listed in James Lewis Howe's unexcelled Bibliography of the Platinum Metals and the plan followed is in general the same as outlined by him. The abbreviations used are familiar to all chemists.

Grateful acknowledgments are due especially to the libraries

of the Massachusetts Institute of Technology, the Library of Harvard University, the Boston Public Library and to the Library of the American Academy of Arts and Sciences. Also to the Boston Atheneum and to the libraries of Columbia University, N. Y., and the Surgeon General's Office and the Patent Office in Washington. The author also desires to express his thanks and appreciation of a grant allowed him by the American Association for the Advancement of Science toward expenses incurred in the preparation of the Bibliography.

CHARLES L. PARSONS.

Durham, N. H., Oct. 1, 1908.

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INTRODUCTION.

Discovery.—In 1797 L. N. Vauquelin undertook to prove the chemical identity of the emerald and beryl, which had already been suspected by Haüy, and in the course of his analytical research, discovered that a portion of the precipitate which had previously been supposed to be aluminium hydroxide, was thrown out of its solution in potassium hydroxide on boiling. He also found that this new hydroxide was soluble in ammonium carbonate, formed no alum and was in many ways different from aluminum. These observations led him to announce in a paper read before the Institute on Feb. 14, 1898 (1798; 1),[1] the discovery of a new "earth."

Name.—In his first articles on the subject (1798; 1, 2 and 3), Vauquelin refers to the newly discovered oxide as "la terre du Béril," which was translated into German as "Beryllerde," from which the name Beryllium took its rise. At the end of Vauquelin's first article, the editors of the Annales de Chimie suggested the name "glucine," for the new oxide, and Vauquelin in his fourth publication (1798; 4) adopts the suggestion prefacing its use with the remark "on a donné le nom de glucine." As early as 1799, Link (1799; 3) had objected to the use of this term as too closely resembling "glycine," already in use, and indeed, Vauquelin, himself (1798; 3) seems to have accepted it with reluctance. In 1800 Klaproth (1800; 1) objected to its use because the salts of the yttrium earths were also sweet and Ekeberg (1802; 1) agrees with this idea. The name "Beryllium" itself was used when, in 1828, Wöhler, (1828; 2) for the first time, separated the metal. For the sake of uniformity in general usage which is overwhelmingly in favor of the name

[1] References are to Bibliography, Part II.