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The Chemical Works of Carl Wilhelm Scheele

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Oh, so happy I am! No worries over food or drink, no worries over my house, no worries over my pharmaceutical laboratory, no worries over preparation of pharmaceuticals—all of this is just a game for me. But to explain new phenomena, that is my mission. How happy is the researcher when he finds what he has searched so hard, a happiness that makes the heart smile.

Carl Wilhelm Scheele
to Johan Gottlieb Gahn. Christmas 1774

Preface

Despite Carl Wilhelm Scheele's important role in the history of chemistry, surprisingly little has been written about Scheele, and especially in English. For many years, Zekert's German book *Carl Wilhelm Scheele—sein Leben und seine Werke* (Carl Wilhelm Scheele—His life and his works) published in 1931–1934 was the most extensive work on Scheele. In 2015, I published a book in Swedish called *Ett kemiskt äventyr—Carl Wilhelm Scheele och hans värld* (A chemical adventure—Carl Wilhelm Scheele and his world). This book was written in collaboration with Prof. Emeritus Björn Lindeke and Bo Ohlson. This book was divided into two parts, the first being a biography over Scheele and the second part being a survey of Scheele's published works. The present volume is based on the second part of that book.

The aim of this book is to explain Scheele's discoveries to modern readers. To do so, I have arranged all Scheele's publications chronologically (or as close to chronological as possible); the publications have been numbered 1–69. For each publication, I have made a summary of Scheele's experiments and his conclusions. The observations have been explained using modern science. I have not, however, included any lengthy discussions about the background or impact of Scheele's work or tried to put his work into a larger context. This will be saved for a biography over Scheele and Torbern Bergman that I am currently writing, and which will be published by Springer in due course.

A particular problem in the preparation of this volume has been the choice of chemical nomenclature, especially since Scheele never used any systematic nomenclature. Typically, Scheele used a mixture of old traditional Swedish (or German) and Latin names, sometimes abbreviated. To add to the confusion, I have counted to as many as eight different names for hydrochloric acid and fourteen names for sulphuric acid in Scheele's original publications. When no traditional name was available, he used descriptive phrases or he would, when a modern chemist writes "iron(II) chloride", instead describe how he dissolved iron flings in hydrochloric acid and then refer to this solution. Later, he used Bergman's binomial nomenclature to some extent and wrote, e.g., *Ferrum phosphoratum* and *Magnesia*

salita, but not with any consistency. He would still concurrently use names such as *Sal Glauberi*.

Since the aim has been to make Scheele's discoveries accessible to modern readers, I have used modern chemical nomenclature throughout this book. To give the reader an idea of the nomenclature Scheele used, I have frequently included the best available English translations for Scheele's Swedish and German chemical names in parentheses, while Latin names are included in their original forms. In many cases, I have only included modern names since (1) the English translation would cause confusion (e.g. I have used the modern word pyrolusite for the mineral that is called brunsten in Swedish, since the old English word manganese would cause confusion with the metal now called manganese); (2) where Scheele, as described above, did not use any chemical name at all or, (3) where I am not aware of any proper translation. In some cases, the Swedish and German nomenclature Scheele used deviated from the nomenclature used in England at the time. For example, hydrochloric acid was usually referred to as "muriatic acid" or "marine acid" in English, but was (and still is) called "acid of salt" (saltsyra and Salzsäure) in Swedish and German, respectively. Thus, I did not feel that either "muriatic acid" or a direct translation such as "acid of salt" would make any sense.

Finally, I would like to express my gratitude to Apotekarsocieteten (the Swedish Pharmaceutical Society) for granting the rights for this English publication.

Gothenburg, Sweden Anders Lennartson
December 2016

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About the Author

Anders Lennartson obtained his Ph.D. from the University of Gothenburg, Sweden, in 2009. The thesis focused on absolute asymmetric synthesis, i.e. synthesis of optically active compounds using no optically active precursors. According to most textbooks, this synthesis was considered impossible. However, by employing a crystallisation technique known as total spontaneous resolution, Anders became the first to optically resolve five- and seven-coordinate metal complexes. Since then, Anders has worked at the University of Southern Denmark (Odense, Denmark), the Chalmers University of Technology (Gothenburg, Sweden) and the University of Gothenburg.

Over the past years, Anders has also become interested in the history of chemistry, paying special attention to the history of Swedish chemistry and the history of stereochemistry.