

Preface

The electrical properties of molecules and molecular complexes are the subject of a close attention up today. While the multipole electric moments have studied good enough, any information about the polarizabilities, especially higher polarizabilities, is quite scarce. At the same time, these interaction-induced properties play often the key role to understand many physical and chemical properties of interacting molecules or atoms. The knowledge of such interactions is important for lot of applications in science and engineering. This small book summarizes mainly the researches carried out last decade by group of Tomsk State University and devoted to interaction-induced electrical properties (multipole moments, (higher)polarizabilities) of van der Waals complexes. We hope that this short survey gives useful contribution to the theory of molecular interactions to be applied for modeling of different physical chemical properties of interacting species, for describing the long-range potential energy surfaces and the surfaces of some electrical properties of van der Waals complexes.

We want to express our appreciation to one of the authors of the book, to Dr. Mikhail Buldakov, who being the talented experimentalist was also often as a mover for many of theoretical researches discussed in the book. Unfortunately, he passed away when the book was still far to be finished. But the main ideas of the book were agreed with him. Moreover, we did not consider it possible to do large changes in the texts of original papers which were used to be included to the book because the results underlying these articles have been suffered in the heated arguments with him and bear his spirit.

Also, we thank Dr. Natalia Zvereva-Loëte and Dr. Vincent Boudon for joint efficient researches of the interaction energies, dipole moments, and polarizabilities of the van der Waals complexes $\text{CH}_4\text{-N}_2$ and $\text{C}_2\text{H}_4\text{-C}_2\text{H}_4$, the results of which were also used in the book.

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