



# Chemical Evolution: The Biological System of the Elements

*Bernd Markert, Stefan Fränzle, Simone Wünschmann*

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**Chemical Evolution: The Biological System of the Elements** Bernd Markert, Stefan Fränzle, Simone Wünschmann

This book is written for researchers and students interested in the function and role of chemical elements in biological or environmental systems. Experts have long known that the Periodic System of Elements (PSE) provides only an inadequate chemical description of elements of biological, environmental or medicinal importance. This book explores the notion of a Biological System of the Elements (BSE) established on accurate and precise multi-element data, including evolutionary aspects, representative sampling procedures, inter-element relationships, the physiological function of elements and uptake mechanisms. The book further explores the concept Stoichiometric Network Analysis (SNA) to analyze the biological roles of chemical species. Also discussed is the idea of ecotoxicological identity cards which give a first-hand description of properties relevant for biological and toxicological features of a certain chemical element and its geo biochemically plausible speciation form. The focus of this book goes beyond both classical bioinorganic chemistry and toxicology.

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