

Chemical Elements in Plants and Soil: Parameters Controlling Essentiality

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Earlier works on plant essential elements have revealed a series of complicated, counter-intuitive relationships among various chemical elements in different plant species, due to both unlike usage of certain elements in plants and to different carriers effecting resorption and transport.

In an attempt to provide a more coherent theory behind plant mineral nutrition, this groundbreaking book adopts a very different approach from the existing literature, presenting an explanation of the essentiality of chemical elements in biological systems and the application of stoichiometric network analysis (SNA) to the biological system of elements. Starting with data from biochemical environmental analysis, and a discussion of the phenomena involved in metal ion partition and autocatalytic behaviour, conditions and criteria controlling the partition of metals into biomass are investigated. Several rules are derived and investigated in terms of their interaction both in comparisons among contemporary organisms and in terms of evolution. This allows the construction, for example of a map which directly traces the biological feature of essentiality to parameters of coordination chemistry.

The book will have worldwide appeal for researchers interested in fields such as soil/plant interactions, bioinorganic chemistry, plant nutrition, phytomining, bioremediation, biogeochemistry, nutrient cycling, soil chemistry, and cellular physiology.

