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Rare Earth Elements – Environmental occurrence and mobilities

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Because the abundances of rare earth elements are strongly intercorrelated, lacking data can be estimated from adjacent element concentrations. Because Ce can be oxidized to Ce(IV) and Eu can be reduced to Eu(II), deviations from the calculated values have been defined as positive or negative anomalies. The anomalies permit conclusions of mineral weathering, transportation and adsorption.

Anomalies detected in soils did not cause respective anomalies in apple leaves, blossom leaves nor fruits, which prevents conclusions of geographical origin. In the apple plants, Ce showed negative anomalies throughout, particularly in the blossom leaves. To the contrary, Eu showed positive anomalies throughout, particularly in the green leaves, which suggests uptake similar to Ca.

In green leaves (apples) growing in the temperate climatic zone, concentrations of rare earth elements increase with age, like for other elements of low physiological interaction also, whereas nutritional and essential trace elements remain constant or decrease.