

## **TRACE ELEMENT ANALYSIS OF DIETARY SUPPLEMENTS AND NUTRIENTS BY TXRF**

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In the last decades, total reflection X-ray fluorescence (TXRF) analysis was proven to be an easy and versatile method for the determination of trace elements [1]. TXRF can be applied to different sample types, like solids in form of micro fragments, powders, suspensions, thin films or liquids. The required sample amount is in the low  $\mu\text{g}$  or  $\mu\text{l}$  range, respectively. In TXRF the samples are prepared as thin film or layer, thus matrix effects are negligible. Quantification is possible by means of the known concentration of an internal standard element.

However, because of the large size and high operative costs, the application of this method was restricted to large research and development laboratories. But recently with the introduction of low-power benchtop instruments, this analytical method starts to get established even in small laboratories for research or routine applications.

This has opened new doors in the rapidly growing field of Phytoforensic chemistry. This presentation will present a brief outline of the instrumental design and theory of TXRF followed by case studies demonstrating how the technique is utilized in every day laboratory analysis. In particular, heavy metal contamination, particle contamination and lot comparison profiling of dietary supplement products will be presented. "Fingerprinting" or Authentication of products can be readily done using TXRF derived concentrations or the spectra with principal component analysis techniques.

[1] Klockenkämper, R. (1997), *Total-Reflection X-Ray Fluorescence Analysis*, Wiley & Sons

NOTES FOR COMMITTEE

- TRACE ELEMENT OR TXRF session
- ORAL PRESENTATION preferred , Poster possible