



**POSTER #28**

## **QUANTITATIVE CHEMICAL ANALYSIS IN TEM**

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The main analytical tools which are used for chemical composition analysis of materials in TEM are energy dispersive X-ray spectroscopy (EDS) and electron energy loss spectroscopy (EELS). While EDS reveals atomic composition only, EELS can give additional information regarding the nature of the atoms, their bonding, nearest neighbor distributions, and their dielectric response. However, for proper quantitative chemical analysis several factors have to be carefully considered, such as specimen thickness to compensate for X-ray absorption. Here extrapolation techniques are sometimes helpful. It is important to carefully determine the limit of detection for correct quantitative interpretation of the analysis data.

Several techniques exist to use EDS and/or EELS for chemical analysis, such as point analysis, line-scans, convergent beam analysis, and the spatial difference technique. Each method can give powerful quantitative information if properly used. In this work the mentioned methods will be presented and discussed in terms of experimental practice, advantages, limitations and detection limit, while some useful examples will be considered.