

## **THE LINE OVERLAP CORRECTION BY THEORETICAL INTENSITY**

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In XRF, when an analysis line has the influence of an overlapping line, the analysis value needs to be calculated by the true intensity that is corrected with overlap correction. In order to investigate the overlapping line, qualitative scan analysis should be performed neighboring analysis line and one must study the obtained peak. This work requires a good knowledge of the XRF, and is not easy for a beginner.

When the analysis line and the interfering line are the same wavelength, the overlap correction of this interfering line will be estimated with a different spectrum for the interfering element. In this case, both lines of the interfering element behave with good correlation each other. When the absorption edge of a coexistence element is positioned between both lines, the correlation relation is poor and exact correction cannot be performed. In analysis of a multilayer thin-film sample, its influence behavior becomes more complex because the parameter of thickness is added.

For the analysis of TiN layer in TiN/Ti/Siwafer, N-Ka intensity is corrected by the estimated intensity of Ti-L<sub>1</sub>,L<sub>n</sub> based on using the measured intensity of Ti-La because N-Ka and Ti-L<sub>1</sub>,L<sub>n</sub> are positioned at the same angle. The existence of a nitrogen absorption edge between Ti-La and Ti-L<sub>1</sub>,L<sub>n</sub> results in the poor relation among those lines due to the nitrogen concentration and thickness changing. The theoretical X-ray intensities calculated by FP method for Ti-L<sub>1</sub>,L<sub>n</sub> which cannot be measured directly, are used to correct N-Ka intensity.

In this study, examples of analysis using these features efficiently and the possibility of the application field will be presented.