Depth Analysis with Bench-Top TXRF Instrument

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Non destructive analysis of elements distributed on and below a surface of a material can be performed using X-ray standing waves. Angle dependent grazing incidence X-ray fluorescent analysis can achieve this object. Theoretical equations for this method had been derived[1] and were applied mostly to experiments in synchrotron radiation facilities[2,3].

We developed a XRF depth analysis software which cooperates with a bench-top TXRF instrument. This instrument is small but has an automatic alignment function of X-ray optics so that height and angle of monochromatic X-ray beams are always aligned accurately to a surface of any measuring sample. By taking angle dependent grazing angle XRF data and applying depth analysis software, non destructive depth analysis of the sample can be performed.

The depth analysis with the bench-top TXRF instrument was applied to glass samples, deposited films and island materials on a glass substrate. Height of deposited island materials on a substrate was evaluated with the software. And coverage of islands on a surface is also estimated by comparing the intensities of X-rays from islands with those from the substrate.

References

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