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Multiscale elemental analysis of buried interfaces in multilayered structuresPatrick CHAPON¹, Jocelyne Marciano¹, Bernd Bleisteiner², Sofia Gaiaschi¹¹HORIBA, Palaiseau, France ²HORIBA Jobin Yvon GmbH, Bensheim, Germany

patrick.chapon@horiba.com

Elemental analysis of buried interfaces in multilayered structures (for instances conversion layers under organic coatings or hybrid organic/inorganic solar cells) and encapsulated materials is extremely challenging. Two analytical techniques offering quick insight into materials – Micro XRF and Glow Discharge Optical Emission Spectrometry - can help to optimize and control the manufacturing process and understand failure causes.

Micro XRF offering both transmission and fluorescence images directly permits to measure encapsulated electronic components without preparation as the probing beam consists of X Rays that could penetrate deeply in polymers, and not electrons. At the same time the lateral resolution of micro XRF can be as good as 10µm but depth resolution is limited.

On the other hand Glow Discharge Optical Emission Spectrometry relies on a plasma to sputter the material of interest and excite the sputtered species offering fast elemental depth profiles. The technique measures all elements (including H, Li, C, O, N) with nanometre depth resolution but it has no lateral resolution. Ultra Fast Sputtering of organic layers is achieved by adapting the plasma gas nicely revealing embedded layers. Synergies and complementarities of the techniques will be described and examples of applications presented.

Keywords

GDOES

µ XRF

buried interfaces

elemental analysis

lateral and depth resolution