
Inspection of alterations of glass surfaces and functional coatings for energy conversion systems by secondary neutral mass spectrometry (SNMS)

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Abstract

Transparent coatings on glass are key components for modern energy conversion systems such as PV, CSP and solar fuels. The functional performance of the coating depends on the constant chemical and physical material properties that enable efficient energy conversion and ensure a long service life. Chemical changes in the bare glass surfaces of semi-finished products due to storage and cleaning, as well as the ageing of coatings on glasses during processing, post-processing and under operating conditions, were detected by chemical depth profiling with nanometer resolution using secondary neutral mass spectrometry (SNMS). SNMS is an extremely sensitive technique for quantitative multi-elemental analysis of glass surfaces with a detection limit down to parts per million, nearly free from matrix effects resulting from decoupled sputtering-off and ionisation processes.

Keywords: surface, analysis, coatings, chemical depth profiling

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