

Nanometer Thin Films - Investigations by AC-Chip Calorimetry

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Calorimetry is known as a very powerful tool for the characterization of a wide variety of materials and their transitions. The combination of silicon technology and calorimetry opens up new possibilities in this research area as demonstrated recently [1]. Based on a differential AC-calorimeter, we show an improved experimental setup combining the advantages of the different methods. The measurements are done at slow scanning or constant bath temperature. The frequency chosen provides a well defined time scale for the experiment. In several cases, e.g. at glass transition, a direct comparison with results from other dynamic methods like dielectric spectroscopy is possible. Due to the differential setup we achieve sensitivity in the pJ/K range, allowing us to measure glass transition or crystallization of samples below 1 ng, and, consequently, films down to 1 nm thickness [2, 3].

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