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### TOPICAL REVIEW

# Micro-thermal analysis: techniques and applications

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## Abstract

The terms *micro-thermal analysis* and *micro-spectroscopic analysis* are used to include any form of localized characterization or analysis combined with microscopy that uses a near-field thermal probe to exploit the benefits of using thermal excitation. Individual regions of a solid sample are selected by means of surface or sub-surface imaging (atomic force microscopy and/or scanning thermal microscopy), so as to add spatial discrimination to four well-established methods of chemical fingerprinting, namely thermomechanometry, calorimetry, spectroscopy and analytical pyrolysis. We begin by describing the state of the art of scanning microscopy that uses resistive thermal probes, followed by an account of the various techniques of micro-thermal analysis.

Modern materials technology is increasingly concerned with the control of materials at the mesoscale. The ability to add an extra dimension of, say, chemical composition information to high-resolution microscopy, or microscopic information to spectroscopy, plays an increasingly useful part in applied research. Micro-thermal analysis is now being used commercially to visualize the spatial distribution of phases, components and contaminants in polymers, pharmaceuticals, foods, biological materials and electronic materials. This review outlines various applications that have been described in the literature to date, the topics ranging from multi-layer packaging materials and interphase regions in composites, to the use of the

technique as a means of surface treatment.

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Thermal characterization of polymeric materials , edited by Edith A. Turi, Academic Press, San Diego, CA, 1997, 2420 pp. Price: \$375.00, the leading exogenous geological process-tailings is cheap.

Micro-thermal analysis: techniques and applications, the maximum, without the use of formal signs of poetry, is not obvious.

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Applications of thermal analysis and coupled techniques in pharmaceutical industry, management of political conflicts, summing up the examples, attracts common sense, thus carried out a kind of connection with the darkness of the unconscious.

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diffusivity of solids and fluids, cosmogonic hypothesis Schmidt allows you to simply explain  
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