

# DECONVOLUTION OF DSC HEAT TRANSFER FUNCTIONS IN THE GLASS TRANSITION TEMPERATURE RANGE

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## ABSTRACT

**D**ifferential **S**canning **C**alorimetry (DSC) is a fast, convenient and sensitive technique for measuring the heat capacities ( $C_p$ ) of solids and liquids. It is especially useful for characterizing the glass transition, which is a kinetic event that occurs between the high temperature liquid state and low temperature glassy state. The observed kinetics of this transition are influenced by the DSC instrumental time response, which must therefore be deconvoluted from the observed data to obtain the true glass transition kinetics. We found that the instrumental response function of a TA model DSC was well approximated by  $\exp[-t/\tau_{th}]$ , and that deconvolution of experimental DSC data on a polymer (PolyMethyl MethAcrylate PMMA) was easily implemented with Matlab<sup>®</sup>. These deconvoluted data were compared with the predictions of the standard Tool – Narayanaswamy – Moynihan (TNM) mathematical model of the glass transition kinetics.