

Time Varying Sinusoidal Light Excitation Calorimetry

Ernesto Marin^C, Arlem Lara and Antonio Calderón^S
CICATA-Legaria, IPN, México D.F., México

In the well known thermal relaxation technique a solid sample is supported adiabatically in a recipient, while one of its surfaces is illuminated uniformly at the same time that the temperature, T , of the opposite surface is measured as a function of time, t . From the dependence $T(t)$ the value of the specific heat capacity, C , can be determined straightforwardly. Although the method requires very simple instrumentation its main disadvantage relies in the fact that very small differences in C cannot be discriminated, and this limits its application in a general way because the values of this parameter in solid materials falls within a relatively narrow margin. In this work we have calculated the function $T(t)$ in the case of variable illumination, specifically for sinusoidal varying light power of the form $P=P_0(1+\cos(\omega t))$, where P_0 and ω are constants. We discuss the peculiarities and the advantages of this variant of the method, henceforth referred as “Time varying sinusoidal light excitation calorimetry”, when compared with the case of constant illumination.