Department of Materials and Metallurgical Engineering

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MET 624 Thermoelastic Effect April 20, 2014

A crystal of molecular weight 100, density of 6000 kg/m3, thermal coefficient of volumetric expansion of 3x10-5 K-1, and Cp of 28.0 J\*gmole-1K-1 is to be subjected to axial stress. If the crystal is well insulated and its temperature change can be resolved to 0.002 K, what level of stress can be detected through temperature measurement?

$$\left(\frac{dT}{dσ}\right)\_{Q}=-\frac{VTα}{3Cp}$$