

Thesis Title	Measurement of Specific Heat Capacity of Superconducting YBa ₂ Cu ₃ O _{7-x} from 20 to 300 K	
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M.S.	Physics	
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Abstract

In this research work an experimental system for measurement of specific heat of solid by means of adiabatic method has been set up. The system composed of a closed circuit refrigerator, a set of high resolution multimeters, a sensitive temperature controller and a high vacuum system. Controlling and data manipulation were carried out via IEEE 488 buses linked between these instruments and microcomputer program in conjunction with a software instruction written and compiled in QuickBASIC.

The system was first calibrated by a test run of the experiment from 20 - 300 K employing copper sample as a known standard. Good agreement with the published value of specific heat in this range was observed. Then experiment with YBa₂Cu₃O_{7-x} was carried out also in the range 20 - 300 K. The anomaly change of the specific heat was observed in the range 90 -95 K. From the analysis of the specific heat data it was found that the critical temperature $T_c = 92.5\text{K}$, $\Delta C/T_c = 32\text{ mJ/mole-K}^2$, Sommerfeld constant $\gamma = 22\text{ mJ/mole-K}^2$ and the Debye temperature $\Theta_D = 556\text{ K}$.