In this study, production of thermo-regulating cotton fabrics with heat storage property is aimed. For this aim microencapsulated PCMs with Poly(methyl methacrylate-co-acrylic acid) (PMMA-co-AA) shell and n-octadecane core were used. Microcapsule application process to the fabrics was optimized to get high heat storage capacity in fabrics. For microcapsule applications to the cotton fabric, 1,2,3,4-butanetetracarboxylic acid (BTCA), and Fixapret Resin F-Eco (F-ECO) cross-linker were used.

Chemical characterization of the microcapsule incorporated fabrics was carried out by Fourier transform infrared (FT-IR) spectroscopy method as thermal properties were measured using a Differential Scanning Calorimeter (DSC). The morphology of the fabrics and the presence of the microcapsule on the fabric samples were analyzed by Scanning Electron Microscopy (SEM) instrument. FT-IR spectroscopy and morphology analysis proved the constitution of microcapsules in the cotton fabrics. Thermo-regulation property of the fabrics was investigated by Thermal History System composed of insulated boxes, temperature sensors and a data-logger. According to the thermal analysis results, the heat absorption of the fabric samples was in the range of 1.4-11.6 J/g between 25-27 °C while they release in the range of 0.7-7.7 J/g between 23-25 °C.