

**Abstract:** DDSA cotton materials were prepared by esterification reaction in aqueous suspension medium using an environmental friendly method. The main factors affecting the reaction, including temperature and pH of the system, were investigated and 40°C and pH 8.5 were defined as the best reaction conditions to obtain DDSA cotton.

The chemical structural characteristics of the samples were investigated by FTIR-ATR methods. In the DDSA cotton spectrum, some characteristic peaks of DDSA were found located at 1721  $\text{cm}^{-1}$  corresponding to the stretching vibration of the ester carbonyl group and at 1536  $\text{cm}^{-1}$  relating to the asymmetric stretching vibration of the carboxylate  $\text{RCOO}^-$  that confirm the cotton modification.

All samples were characterized by contact angle, SEM and swelling measurements. Compared to cotton without treatment, the hydrophobic performance of the ester had increased. The maximum contact angle of DDSA cotton could reach 112°, and the corresponding adhesion work was 45.53  $\text{mJm}^{-2}$  for optimal reaction conditions.