Styrene/stearyl methacrylate foams as oil absorbent
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Abstract: The approach of high internal phase emulsion (HIPE) was adopted for developing oil absorbent foams in this research. Effects of monomer compositions and contents of surfactant and cross-linking agent on foam’s microstructure and oil absorption efficiency were investigated. Foams derived from styrene (S) and stearyl methacrylates (SMA) monomers were successfully prepared with 0.75 and 1 g of surfactant per 50 ml of aqueous phase. However, S/SMA foams with inhomogeneous foam structure, investigated by scanning electron microscope, were obtained when S/SMA weight ratios were less than 1. Moreover, the oil absorption capacity of S/SMA foams tended to increase with the S/SMA ratio. Results from 1:1 S/SMA foams prepared with 20-50% w/w of divinylbenzene (DVB) per monomers revealed that their oil absorption efficiency was possibly improved by lowering the content of cross-linking agent. The absorption capacity of these oil absorbents was ranging from 6 to 19 g/g. Although high oil absorbency can be achieved with S/SMA foams, their oil recovery capacity by pressing is challenging. Therefore, the study on this issue is on-going.

Keywords: Acrylate foam; High internal phase emulsion polymerization; HIPE; Oil absorbency; Styrene foam