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STUDY ON MOLECULAR WEIGHT GROWTH THROUGH EMULSION POLYMERIZATION OF VINYL CHLORIDE BY USING RESPONSE SURFACE METHODOLOGY

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In recent work, the effects of some crucial parameters were experimentally investigated on the molecular weight (MW), and molecular weight distribution (MWD) of emulsified poly vinyl chloride in a batch reactor by using response surface methodology (RSM). Here in, the variables were chosen as temperature (T), water to monomer weight ratio (R) and Emulsification system (E). While using RSM, we were interested in studying both the individual and interactive effects of such parameters on time dependent conversion through emulsion polymerization of vinyl chloride. Finally, it was found that temperature had the most significant influence on MWD of the produced samples. However, other factors have had their effects on the mentioned responding variables, especially MWD. Besides, while using sodium dodecyl sulfate surfactant, build up period of conversion curve was more pronounced compared with both sodium dodecyl benzene sulfonate and cetyl alcohol surfactants. As an instance, while using sodium dodecyl sulfate and cetyl alcohol surfactant at 45 °C, the MW and poly dispersity index were respectively more and less than that of latex comprising sodium dodecyl benzene sulfonate emulsifier at the same temperature. Instead, the trend was completely inversed when the temperature was set at 50 °C. After analysing with RSM, it was also observed that water to monomer weight ratio had a minor effect on MWD, as well.