Non-ionic surfactant vesicles were prepared using Span-60 and cholesterol in the mass ratios of 1:1, 2:1, 1:2 and 3:1 for transdermal delivery of an anti-inflammatory drug meloxicam (MXM). The drug encapsulation efficiencies and particle size were observed in the range of 32.9–80.7% and 56.5–133.4 nm, respectively. Three different gel bases were also prepared using Poloxamer-407, Chitosan and Carbopol-934 as polymers to study the performance of the in vitro release of the drug. Prepared gels were also converted into niosomal gels. In vitro release characteristics of MXM from different gels were carried out using dialysis membrane in phosphate buffer (pH 7.4). The poloxamer-407 gel or niosomal poloxamer-407 gel showed the superior drug release over the other formulations. The release data were treated with various mathematical models to assess the relevant parameters. The results showed that the release of MXM from the prepared gels and niosomal gels followed Higuchi’s diffusion model. The flux of MXM was found to be independent on the viscosity of the formulations. The
anti-inflammatory effects of MXM from different niosomal gel formulations were evaluated using carrageenan-induced rat paw edema method, which showed superiority of niosomal gels over conventional gels.