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Formulation of multilayer oil-in-water emulsions containing silicone

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Summary: *The objective of this study was to develop multilayer oil-in-water emulsions containing silicone for increasing deposition efficiency of silicone on hair. Emulsion cores prepared by emulsion phase inversion method consisted of 10% w/w of dimethicon, 7.44% w/w of Tween 80, 6.56% w/w of Span 80, 5.24% w/w of ethanol and distilled water. The droplet size and zeta potential of silicon oil droplets were 203 nm and -43.2 mV, respectively. The silicone oil droplets were consecutively coated with solution of 0.05% w/v of chitosan, 0.05% w/v of sodium alginate and 0.05% w/v of chitosan to obtain three alternate layers by layer-by-layer deposition method. Effect of volume of three coating solutions to droplet size and zeta potential of mutilayer emulsions was investigated. The droplet size and zeta potential of optimal multilayer emulsion were 202.4 nm and 24.2 mV, respectively. The images taken by optical microscope proved that multilayer emulsions improved deposition efficiency of silicon on hair. Besides, the results obtained from Hen's egg test indicated that multilayer emulsions were relatively safe and almost did not cause irritation.*