



Faculty of Science
Chemistry Department

Tailoring nanosized polymeric materials for some drug delivery

Thesis
Submitted for Ph.D Degree in Chemistry

By

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(B. Sc. 2002, M. Sc. 2007)

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R. A. A. Sobh

List of Abbreviations

Abbreviation	Meaning
MMA	Methyl methacrylate
HEMA	2-hydroxyethyl methacrylate
SDS	Sodium dodecyl sulfate
APS	Ammonium persulfate
SA	Sodium alginate
PVP	Polyvinyl pyrrolidone
PEG	Polyethyleneglycol
SAS	Supercritical antisolvent method
RESS	Rapid expansion of supercritical solution
RESOLV	Rapid expansion of supercritical solution into a liquid solvent method
CMC	Critical micelle concentration
R _p	Rate of polymerization
GPC	Gel permeation chromatography
DSC	Differential scanning calorimetry
T _g	Glass transition temperature
EE	Entrapment efficiency
PZQ	Praziquantel
PCL	Poly(ϵ -caprolactone)
TEM	Transmission electronic microscopy
ESE	Emulsion solvent evaporation
NSAIDs	non-steroidal anti-inflammatory drugs
FDA	Food and Drug Administration

Aim of the work

The work in this thesis is aimed to study the feasibility of synthesis of polymeric nanoparticles in thermodynamically stable and transparent latex through differential microemulsion polymerization technique. This technique is characterized by spontaneous formation, ease of manufacture, tolerance towards additives, stability over a wide temperature range, low viscosity and improved solubilization of bioactive materials. In addition to, the ability of increasing the solid content while using least amount of emulsifier.

So, it is aiming to study the polymerization of methyl methacrylate MMA and 2-hydroxyethyl methacrylate HEMA to produce their copolymer nanoparticles (less than 100nm) as biocompatible polymer using different emulsifiers such as sodium dodecyl sulfate SDS and biocompatible emulsifier as sodium alginate SA and polyvinyl pyrrolidone PVP alone or combined with polyethylene glycol PEG.

As well as, finding out the effect of HEMA content in the monomer feed composition on the prepared polymeric nanolatexes in terms of morphology, average particle size, surface tension, turbidity and zeta potential measurements,