Solubilization of phenols by multimolecular aggregates formed by low molecular weight hyperbranched polyglycidol

Olea A.F.

Acevedo B.

Ossandon L.

Worrall D.

Hyperbranched polymers have been proposed as potential carriers or host compartments for controlled drug delivery. In this work the solubilization of alkylphenols into aggregates formed by hyperbranched polyglycidol HPG and its ester derivative has been studied. HPG17 was synthesized by ring-opening polymerization of glycidol, and then the ester HPG4-RBr13 has been obtained by reaction of hPG17 with 2-bromo isobutyryl bromide. The critical aggregate concentration CAC and micropolarity of aggregates were determined by using pyrene as fluorescence probe. CAC values obtained are 2.5 mM and 0.25 mM, for HPG17 and HPG4-RBr13, respectively. Our results indicate that the hydrophobic effect is larger for HPG4-RBr13, and that their aggregates are more hydrophobic, than for HPG17. In addition, their sizes and sizes distribution were determined by DLS. The partition of phenols between the micellar and aqueous phase was studied by using the pseudo-phase model, and the results show that the partition coefficients increases with increasing length of the side alkyl chain, and are larger for HPG4-RBr13 micelles than for HPG17 micelles.

Fluorescence probing

Hyperbranched polyglycidol

Multimolecular aggregates

p-Alkylphenols

Partition coefficients

Aggregates

Controlled drug delivery

Dendrimers

Esters

Fluorescence

Hydrophobicity

Micelles

Phenols

Solubility

Alkylphenols

Fluorescence probes

Fluorescence probing

Hydrophobic effect

Hyperbranched polyglycidol

Hyperbranched polymers

Low molecular weight

Partition coefficient

Ring opening polymerization

alkylphenol

bromide

ester derivative

fluorescent dye

glycidol

hyperbranched polyglycidol

phenol derivative

polymer

unclassified drug

Article

concentration (parameters)

equilibrium constant

fluorescence imaging

hydrophobicity

molecular weight

particle size

partition coefficient

photon correlation spectroscopy

priority journal

ring opening metathesis polymerization

solubilization

synthesis