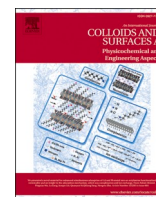




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A novel salt-responsive hydrogel on the base of calixresorcinarene–mPEG amide conjugate

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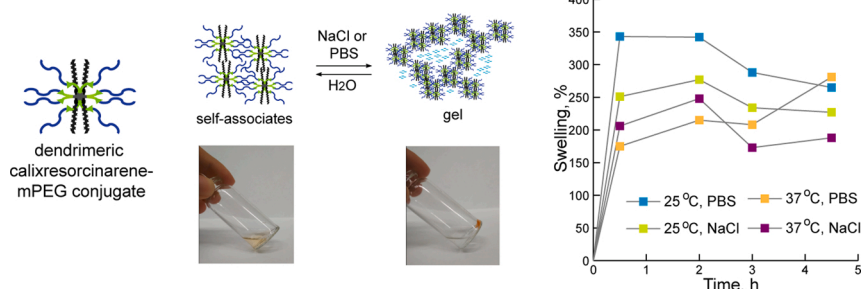
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HIGHLIGHTS

- Amphiphilic and dendrimeric calixresorcinarene–mPEG conjugates were synthesized.
- The dendrimeric conjugate forms salt-responsive hydrogel.
- The hydrogel capable to reversible sol-gel transition.
- The hydrogel has high sorption capacity and salt-responsive release ability.
- The hemotoxicity and cytotoxicity of the conjugates are studied.

GRAPHICAL ABSTRACT



ARTICLE INFO

Keywords:

Calixresorcinarene
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ABSTRACT

A novel low toxic amide calix[4]resorcinarene–mPEG conjugates of amphiphilic and dendrimeric character were synthesized. It was shown that the growth of the temperature or the ionic strength growth of the solution leads to different demonstration of the amplification of hydrophobic interactions in the conjugates self-associates. It was found that in PBS or 0.9 % NaCl solutions the amphiphilic conjugate form micellar solution, and the dendrimeric conjugate – hydrogel, which is capable of the reversible sol-gel transition. It was shown by DSC analysis that the dendrimeric conjugate binds of 15 % of water molecules in an aqueous solution (non-freezing bound water), but in the salt solution the conjugate-water interaction is practically absent. This leads to the additional self-aggregation of conjugate molecules and to the gel formation. The high degree of substrate sorption by the hydrogel (Methylene Blue, encapsulation effectiveness is 78 %) and its reversible binding-release by the regulation of the solution ionic strength have been demonstrated.

1. Introduction

As hydrophilic three-dimensional systems, hydrogels are capable of

imbibing a large amount of water or biological fluids between their polymer chains with the formation of gel networks. They are effective drug delivery systems with the high loading capacity toward transported

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