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Thiacalix[4]arene-functionalized vesicles as phosphorescent indicators for pyridoxine detection in aqueous solution

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Abstract

© The Royal Society of Chemistry 2015. Amphiphilic tetracarboxylate derivatives of p-ter--butylthiacalix[4]arene were obtained by click reactions of the corresponding azido derivatives with acetylene dicarboxylic acid. Embedding of the amphiphilic tetraacids in DPPC vesicles was studied by DLS, AFM, turbidity techniques and by probing with merocyanine 540. The obtained DPPC-calixarene vesicles are effective antennae for Tb(iii) ion luminescence. It allows the use of DPPC-calixarene-Tb(iii) vesicles for the selective detection of analytes with a higher affinity for Tb(iii) due to cation removal from the calixarenes in the DPPC bilayer. It was found that pyridoxine hydrochloride can be selectively detected at the 7 μM concentration in the presence of a 100 fold excess of different biologically important molecules, like amino acids, adenosine phosphates, sugars, amines and ammonium salts.

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