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# Synthesis of new p-tert-butylcalix[4]arene-based polyammonium triazolyl amphiphiles and their binding with nucleoside phosphates

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## Abstract

© 2018 Burilov et al. The synthesis of new calix[4]arenes adopting a cone stereoisomeric form bearing two or four azide fragments on the upper rim and water-soluble triazolyl amphiphilic receptors with two or four polyammonium headgroups via copper-catalyzed azide-alkyne cycloaddition reaction has been performed for the first time. It was found that the synthesized macrocycles form stable aggregates with hydrodynamic diameters between 150–200 nm and electrokinetic potentials about +40 to +60 mV in water solutions. Critical aggregation concentration (CAC) values were measured using a micelle method with pyrene and eosin Y as dye probes. The CAC values of tetraalkyl-substituted macrocycles 12a,b (5  $\mu$ M for both) are significantly lower than those for dialkyl-substituted macrocycles 10a,b (790 and 160  $\mu$ M, respectively). Premicellar aggregates of macrocycles 10a,b and 12a,b with the dye eosin Y were used for nucleotides sensing through a dye replacement procedure. It is unusual that disubstituted macrocycles 10a,b bind more effectively a less charged adenosine 5'-diphosphate (ADP) than adenosine 5'-triphosphate (ATP). A simple colorimetric method based on polydiacetylene vesicles decorated with 10b was elaborated for the naked-eye detection of ADP with a detection limit of 0.5 mM.

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## Keywords

ADP, Amphiphile, ATP, Calix[4]arene, CuAAC, Eosin Y probe, Molecular recognition, Polydiacetylene, Self-assembly, Triazole

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