

## **Amphiphilic calixresorcinarene associates as effective solubilizing agents for hydrophobic organic acids: Construction of nano-aggregates**

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### **Abstract**

© 2016 The Royal Society of Chemistry. Here we represent the first example of the formation of mixed nanoscale associates, constructed from amphiphilic calixresorcinarenes and hydrophobic carboxylic acids including drugs. The amidoamino-calixresorcinarene self-associates effectively solubilize hydrophobic carboxylic acids-drugs such as naproxen, ibuprofen, ursodeoxycholic acid and aliphatic dodecanoic acid-with the formation of the mixed aggregates with the macrocycle/substrate stoichiometry from 1/1 to 1/7. The ionization of organic acids and the peripheral nitrogen atoms of the macrocycles with the subsequent inclusion of hydrophobic acids into the macrocycle self-associates is the driving force of solubilization. In some cases, this leads to the co-assembly of the macrocycle polydisperse associates into supramolecular monodisperse nanoparticles with the diameter of about 100 nm. The efficiency of drug loading into the nanoparticles is up to 45% and depends on the structure of organic acid. The dissociation of the mixed aggregates and release of organic acid are attained by decreasing pH.

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