

Langmuir 2014 vol.30 N50, pages 15153-15161

---

## Langmuir monolayers and thin films of amphiphilic thiacalix[4]arenes. properties and matrix for the immobilization of cytochrome c

Solovieva S., Safiullin R., Kochetkov E., Melnikova N., Kadirov M., Popova E., Antipin I., Konovalov A.

Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

---

### Abstract

© 2014 American Chemical Society. Formation and properties of Langmuir films of thiacalix[4]arene (TCA) derivatives containing N-donor groups on the lower rim (Y=O(CH<sub>2</sub>)<sub>3</sub>CN; OCH<sub>2</sub>CN; NH<sub>2</sub>; OCH<sub>2</sub>ArCN-p) in 1,3-alternate conformation on aqueous subphase and solid substrates have been studied. Only tetra-cyanopropoxy-p-tert-butylthiacalix[4]arene 1 forms a typical monomolecular layer with perpendicular orientation of the macrocycle relative to the water-air interface that is able to immobilize cytochrome c in the entire range of the surface pressure. Obtained monolayers were transferred by Langmuir-Schaefer technique onto quartz, indium-tin oxide (ITO), and silicon. It was demonstrated that protein activity is retained after immobilization on the substrate.

<http://dx.doi.org/10.1021/la504379v>

---