

Accepted Manuscript

Introducing Double Polar Heads to Highly Fluorescent Thiazoles: Influence on Supramolecular Structures and Photonic Properties

M. Kaufmann, M.L. Hupfer, T. Sachse, F. Herrmann-Westendorf, D. Weiß, B. Dietzek, R. Beckert, M. Presselt

PII: S0021-9797(18)30497-1
DOI: <https://doi.org/10.1016/j.jcis.2018.04.105>
Reference: YJCIS 23570

To appear in: *Journal of Colloid and Interface Science*

Received Date: 21 March 2018
Revised Date: 27 April 2018
Accepted Date: 27 April 2018

Please cite this article as: M. Kaufmann, M.L. Hupfer, T. Sachse, F. Herrmann-Westendorf, D. Weiß, B. Dietzek, R. Beckert, M. Presselt, Introducing Double Polar Heads to Highly Fluorescent Thiazoles: Influence on Supramolecular Structures and Photonic Properties, *Journal of Colloid and Interface Science* (2018), doi: <https://doi.org/10.1016/j.jcis.2018.04.105>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



Introducing Double Polar Heads to Highly Fluorescent Thiazoles: Influence on Supramolecular Structures and Photonic Properties

M. Kaufmann^[a,b], M. L. Hupfer^[b], T. Sachse^[b,c], F. Herrmann-Westendorf^[b], D. Weiß^[a], B. Dietzek^[b,c], R. Beckert^{[a]*}, M. Presselt^{[b,c,d,e]*}

[a] Institute of Organic and Macromolecular Chemistry, Friedrich-Schiller-University Jena, Humboldtstraße 10, Jena, 07743, Germany

[b] Institute of Physical Chemistry, Friedrich Schiller University Jena, Helmholtzweg 4, 07743 Jena, Germany

[c] Leibniz Institute of Photonic Technology (IPHT), Albert-Einstein-Str. 9, 07745 Jena, Germany

[d] Center for Energy and Environmental Chemistry Jena (CEEC Jena), Friedrich Schiller University Jena, Jena, Germany

[e] sciclus GmbH & Co. KG, Moritz-von-Rohr Str. 1a, 07745 Jena, Germany

*corresponding authors:

Synthesis: rainer.beckert@uni-jena.de; Phone: +49 3641 948230

Thin films: martin.presselt@leibniz-ipht.de; Phone: +49 3641 206418

Keywords: thiazole, fluorophore, self-assembly, molecular orientation, Langmuir Blodgett technique.

Abstract

Hypothesis

Supramolecular structures determine properties of optoelectronically active materials and can be tailored *via* the Langmuir-Blodgett (LB) technique. Interactions between dyes can cause high crystallinities of Langmuir monolayers, thus rendering retaining their integrity during the LB-deposition challenging. However, increasing degrees of freedom exclusively at the polar anchoring moieties of dyes might improve processability without perturbing the dye's optoelectronic properties nor the function-determining crystallinity of the layer.

Experiments

(Amphiphilic) thiazole dyes without, with a mono-polar, and with a double-polar anchor were synthesized, whereas the two constituting polar moieties of the latter derivate are separated by a flexible alkyl chain. The supramolecular structures and crystallinities of Langmuir and LB monolayers were characterized by means of LB isotherms, atomic force microscopy and polarization-resolved fluorescence spectroscopy.

Findings

As compared to the mono-polar reference the introduction of a flexible double-polar head did not deteriorate UV-vis absorption, emission or electrochemical properties of the thiazole but significantly extended the range of constant compressibility modulus, thus indicating improved processability of the Langmuir monolayers. Indeed, AFM studies revealed that the integrity of the monolayers could

Download English Version:

<https://daneshyari.com/en/article/6990643>

Download Persian Version:

<https://daneshyari.com/article/6990643>

[Daneshyari.com](https://daneshyari.com)