

Technical University of Denmark



Functionalization of PEDOT by Click Chemistry and ATRP

Hoffmann, Christian; Daugaard, Anders Egede

Publication date:
2012

Document Version
Publisher's PDF, also known as Version of record

[Link back to DTU Orbit](#)

Citation (APA):
Hoffmann, C., & Daugaard, A. E. (2012). Functionalization of PEDOT by Click Chemistry and ATRP. Abstract from 49th Nordic Polymer Days 2012, Copenhagen, Denmark.

DTU Library

Technical Information Center of Denmark

General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

Functionalization of PEDOT by Click Chemistry and ATRP

Christian Hoffmann and Anders Egede Daugaard

Danish Polymer Centre, Department of Chemical and Biochemical Engineering, Technical University of Denmark, 2800 Kgs. Lyngby, Denmark

Conductive polymers have received increasing attention and many investigations have been conducted in order to develop the properties of conductive polymers and extend the application field. Poly(3,4-ethylenedioxythiophene) (PEDOT) has been well studied and applied in many different areas such as in biosensors¹, polymer solar cells² or organic light emitting electrodes³.

The recently developed PEDOT-N₃ films can be post polymerization modified through click chemistry with different alkynes, which opens up for a large number of functional groups on the conductive polymer backbone.

In the presented work polymer coatings known to have antifouling properties on gold or silica surfaces have been prepared by introduction of an alkyne functional initiator for ATRP followed by controlled radical polymerizations of different combinations of monomers. The tested monomers have been employed in biofunctional applications to suppress non-specific fouling. "Grafting to" processes have earlier been tested and the presented work is compared to these results⁴. According these investigations of functionalized PEDOT it is possible to retain the conductive properties after surface modification and reduce protein adsorption at the same time.

Scheme 1: Functionalization of PEDOT-N₃ films with initiators, which subsequently was grafted through ATRP.

References

- (1) Luo, S.-chyang; Ali, E. M.; Tansil, N. C.; Yu, H.-hua; Gao, S.; Kantchev, E. A. B.; Ying, J. Y. *Society* **2008**, 8071-8077.
- (2) Krebs, F. C.; Gevorgyan, S. a.; Alstrup, J. *Journal of Materials Chemistry* **2009**, *19*, 5442.
- (3) Armstrong, N. R.; Wang, W.; Alloway, D. M.; Placencia, D.; Ratcliff, E.; Brumbach, M. *Macromolecular rapid communications* **2009**, *30*, 717-31.
- (4) Lind, J. U.; Hansen, T. S.; Daugaard, A. E.; Hvilsted, S.; Andresen, T. L.; Larsen, N. B. *Macromolecules* **2011**, *44*, 495-501.