Pentanol as Co-Surfactant in Polypyrrole Actuators

Conductin polymers have been investigated for the use as active component in polymer actuators. Addition of I-pentanol as co-surfactant to the polymerisation solution is shown to increase the reversible linear strain that can be achieved with polypyrrole films doped with dodecyl benzene sulfonate (PPy-DBS). When such films are prepared without pentanol, the length change between the oxidised and the reduced state is 2.5%. If pentanol is added to the synthesis solution in concentrations above 2.4 vol%, a linear extension of 5.6% was measured at a constant load of 0.6 MPa. The morphology of the film is changed considerable upon pentanol addition, although electrochemical quartz crystal microbalance measurements indicate that pentanol is only incorporated in the polymer to a small extent. The mechanical properties, conductivity and doping level of PPy-DBS films show little or no changes with the addition of pentanol. The use of pentanol as co-surfactant during polymerisation will, therefore, be beneficial for the use of PPy-DBS as active component material in polymer actuators.

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy, Department of Chemistry
Contributors: Bay, L., West, K., Skaarup, S.
Pages: 3527-3532
Publication date: 2002
Peer-reviewed: Yes

Publication information
Journal: Polymer
Volume: 43
Issue number: 12
ISSN (Print): 0032-3861

Ratings:
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Scopus rating (2017): CiteScore 3.59 SJR 1.097 SNIP 1.163
Web of Science (2017): Impact factor 3.483
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 3.77 SJR 1.207 SNIP 1.253
Web of Science (2016): Impact factor 3.684
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): CiteScore 3.72 SJR 1.144 SNIP 1.277
BFI (2014): BFI-level 1
Scopus rating (2014): CiteScore 3.85 SJR 1.326 SNIP 1.613
Web of Science (2014): Impact factor 3.562
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): CiteScore 4.07 SJR 1.414 SNIP 1.649
Web of Science (2013): Impact factor 3.766
ISI indexed (2013): ISI indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): CiteScore 3.74 SJR 1.589 SNIP 1.777
Web of Science (2012): Impact factor 3.379
ISI indexed (2012): ISI indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): CiteScore 4.04 SJR 1.623 SNIP 1.797
Web of Science (2011): Impact factor 3.438
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 1