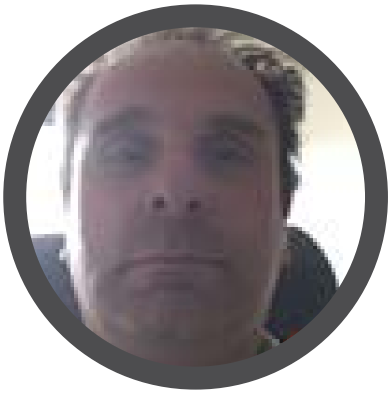
EuroSciCon

3rd Edition of International Conference and Exhibition on

Polymer Chemistry

March 26-28, 2018
Vienna, Austria

Fabio Cicoira, Polym Sci, Volume 4
DOI: 10.4172/2471-9935-C1-007



FLEXIBLE, STRETCHABLE AND HEALABLE ELECTRONICS

Fabio Cicoira

Polytechnique Montréal, Canada

Organic electronics, based on semiconducting and conducting polymers, have been extensively investigated in the past two decades and have found commercial applications in lighting panels, smartphone screens, and TV screens using OLEDs (organic light emitting diodes) technology. Many other applications are foreseen to reach the commercial maturity in future in areas such as transistors, sensors and photovoltaics. Organic electronic devices, apart from consumer applications, are paving the path for key applications at the interface between electronics and biology, such as in polymer electrodes for recording and stimulating neural activity in neurological diseases. In such applications, organic polymers are very attractive candidates due to their distinct property of mixed conduction: the ability to transport both electron/holes and ionic species. Additionally, conducting polymers offer the possibility to tune their surface properties (e.g., wettability or chemical reactivity) by changing their oxidation state, thus promoting or hindering the adhesion of biomolecules. This feature can be particularly useful for enhancing the biocompatibility of implantable electrodes. My talk will deal with processing and characterization of conducting polymer films and devices for flexible, stretchable and healable electronics. This talk will particularly focus on micro-patterning of conducting polymer films for flexible and stretchable devices and on healable of conducting polymer films.

Recent Publications

1. S Zhang, E Hubis, P Kumar, C Girard and F Cicoira (2016) Water stability and orthogonal patterning of flexible microelectrochemical transistors on plastic. J. Mater. Chem. C4 1382–85.
2. P Kumar, Z Yi, S Zhang, A Sekar, F Soavi, *et al.* (2015) Effect of channel thickness, electrolyte ions and dissolved oxygen on the performance of organic electrochemical transistors. Appl. Phys. Lett. 107:053303.
3. Z Yi, G Natale, P Kumar, E Di Mauro, M C Heuzey, *et al.* (2015) Ionic liquid/water mixtures and ion gels as electrolytes for organic electrochemical transistors. J. Mater. Chem. C3 6549–6553.
4. O Berezhetska, B Liberelle, G De Crescenzoa and F Cicoira (2015) A simple approach for protein covalent grafting on conducting polymer films. J. Mater. Chem. B3 5087–5094.
5. S Zhang, P Kumar, A S Nouas, L Fontaine, H Tang, *et al.* (2015) Solvent-induced changes in PEDOT:PSS films for organic electrochemical transistors. APL Mat. 3:014911.

Biography

Fabio Cicoira is a Professor of Chemical Engineering at Polytechnique Montreal. His current research activity focuses in stretchable, flexible and healable organic electronics, bioelectronics and electronic devices based on metal oxides. He received his MSc in Chemistry from the Università di Bologna and his PhD in Materials Science and Engineering from the Swiss Federal Institute of Technology Lausanne. He worked at the National Research Council of Italy and at INRS-EMT and at Cornell University. He has published 67 articles in international peer-reviewed scientific journals and several book chapters. His works have been cited more than 1700 times and his H-index is 25. His research interests are in the fields of Conducting Polymers, Self-Healing, Patterning, Processing, Metal Oxides and Stretchable Electronics.

Fabio.cicoira@polymtl.ca