

The Challenges of Printing Functional Materials on Cellulose Based Substrates

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Abstract

Cellulose substrates offer flexible character; they are cost-effective, readily available and are environmentally friendly. However, using paper as a substrate for printed electronics might be a challenging task. In this work, various paper substrates were employed as a base for printing of conductive and semiconductive materials including conductive polymer (poly(3,4-ethylenedioxy-thiophene)-poly(styrene-sulfonate), commonly known as PEDOT-PSS, and poly 3-hexylthiophene semiconductor. These materials were printed using a piezoelectric inkjet printer and printed features were evaluated in terms of print quality and electrical performance. Paper substrate properties were characterized using standard methods. The most critical substrate and ink properties are presented and their influence on the printability and electrical performance are discussed.