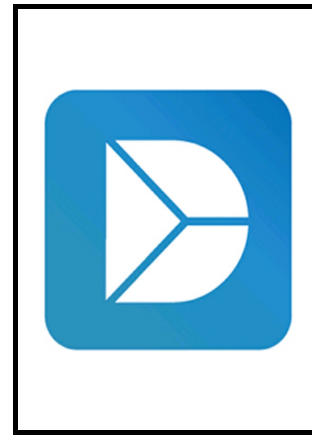


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Data on Kilometer Scale Production of Stretchable Conductive Multifilaments Enables Knitting Wearable Strain Sensing Textiles

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Data article

Title: *Data on Kilometer Scale Production of Stretchable Conductive Multifilaments Enables Knitting Wearable Strain Sensing Textiles*

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Abstract

This data article contains analyzed data for the article “Continuous Production of Stretchable Conductive Multifilaments in Kilometer Scale Enables Facile Knitting of Wearable Strain Sensing Textiles” (Seyedin *et al.* 2018) [1]. Details of wet-spinning conditions to achieve scaled-up production of stretchable and conducting polyurethane/poly(3,4-ethylenedioxythiophene):poly(styrenesulfonate) (PU/PEDOT:PSS) multifilaments are provided. The stress-strain curves for tensile and stretch-relaxation tests on the multifilament and different knitted textile structures (plain-knit, co-knit, co-knit-alternate, co-knit with conductive stitch, and plain with non-conductive stitch) are presented. It is shown that the PU/PEDOT:PSS multifilaments can also be knitted into fabrics that when worn on various body parts, such as knee, elbow, and finger, can monitor their various movements.

Specifications Table

Subject area	<i>Materials Engineering, Chemistry</i>
More specific subject area	<i>Functional fiber fabrication, wearable strain sensors</i>
Type of data	<i>Figures, table, electron microscopy image, photographs, videos</i>
How data was acquired	<i>Custom-built wet-spinning machine (Dissol Pty. Ltd.), tensile testing instrument (Instron 5967), field emission scanning electron microscope (SEM, JEOL JSM-7800F)</i>
Data format	<i>Analyzed</i>
Experimental factors	<i>Poly(3,4-ethylenedioxythiophene):poly(styrenesulfonate) (PEDOT:PSS) pellets (Agfa Orgacon™ Dry) were dispersed in dimethyl sulfoxide (DMSO) using a homogenizer (IKA T25 Digital, ULTRA-TURRAX) at 25,000 rpm for about 1 hour. Polyurethane (PU, AdvanSource Biomaterials Chronoflex® C 80A) solutions in DMSO or dimethyl formamide (DMF) were separately prepared and mixed with the PEDOT:PSS solution to produce spinning formulations.</i>
Experimental features	<i>The PU/PEDOT:PSS spinning formulation was injected into a coagulation bath through a 100-hole spinneret using a metering pump at a controlled flow rate of $\sim 1 \text{ mL min}^{-1}$. The fibers were then passed continuously through several wash baths and a non-contact heating column at 80 °C for drying and were finally collected onto a spool.</i>
Data source location	<i>Institute for Frontier Materials, Deakin University, Geelong, VIC 3220, Australia</i>
Data accessibility	<i>Data are provided with this article</i>

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