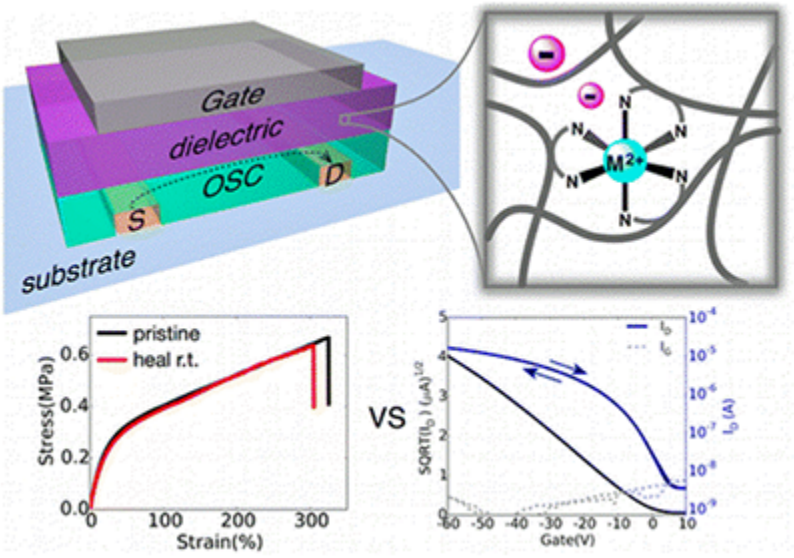
Docket #: S17-167

STRETCHABLE SELF-HEALING POLYMERIC DIELECTRICS CROSSLINKED THROUGH METAL-LIGAND COORDINATION

Stanford researchers at the Bao Lab have developed a new self-healing polymer system which employs metal?ligand (Fe2+, Zn2+-bipyridine) interactions. These stretchable self-healing polymeric dielectrics are mechanically robust and stable, with high electrical performance, and low gate current leakage when integrated into OFETs. It is believed to be the first example of integrating such a system into OFETs as gate insulators. This work can provide guidance on the future design of self-healing stretchable dielectric materials based on metal–ligand cross-linked polymers for applications like flexible electronics.

Figure



Stage of Research

- Fully stretchable transistors with FeCl2-PDMS dielectrics were fabricated and exhibited ideal transfer characteristics.
- The gate leakage current remained low even after 1000 cycles at 100% strain.
- The mechanical robustness and stable electrical performance proved its suitability for applications in stretchable electronics.

Applications

- Integration into **flexible electronics for wearable electronics and medical devices**

Advantages

- Fast self-healing ability at ambient condition
- Mechanically robust and stable
- High electrical performance
- Low gate current leakage even after 1000 cycles at 100% strain

Publications

- Rao, Ying-Li, Alex Chortos, Raphael Pfattner, Franziska Lissel, Yu-Cheng Chiu, Vivian Feig, Jie Xu et al. "Stretchable self-healing polymeric dielectrics cross-linked through metal–ligand coordination." *J. Am. Chem. Soc* 138, no. 18 (2016): 6020-6027.

Patents

- Published Application: 20170331057
- Issued: 10,177,326 (USA)

Innovators

- Zhenan Bao
- Jong Won Chung

- Ying-Li Rao
- Sangyoon Lee

Licensing Contact

Evan Elder

Senior Licensing Associate

Email