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**Photo-Patterned Ion Gel Electrolyte-Gated Thin Film Transistors** JAE-HONG CHOI, YUANYAN GU, Department of Chemistry, University of Minnesota, KIHYUN HONG, C. DANIEL FRISBIE, Department of Chemical Engineering and Materials Science, University of Minnesota, TIMOTHY P. LODGE, Departments of Chemistry and Chemical Engineering and Materials Science, University of Minnesota — We have developed a novel fabrication route to pattern electrolyte thin films in electrolyte-gated transistors (EGTs) using a chemically crosslinkable ABA-triblock copolymer ion gel. In the self-assembly of poly[(styrene-*r*-vinylbenzylazide)-*b*-ethylene oxide-*b*-(styrene-*r*-vinylbenzylazide)] (SOS-N<sub>3</sub>) triblock copolymer and the ionic liquid, 1-ethyl-3-methylimidazolium bis(trifluoromethylsulfonyl)imide ([EMI][TFSI]), the azide groups of poly(styrene-*r*-vinylbenzylazide) (PS-N<sub>3</sub>) end-blocks in the cores can be chemically cross-linked via UV irradiation ( $\lambda = 254$  nm). Impedance spectroscopy and small-angle X-ray scattering confirmed that ion transport and microstructure of the ion gel are not affected by UV cross-linking. Using this chemical cross-linking strategy, we demonstrate a photo-patterning of ion gels through a patterned mask and the fabricated electrolyte-gated thin film transistors with photo-patterned ion gels as high-capacitance gate insulators exhibited high device performance (low operation voltages and high on/off current ratios).

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