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Electrically Conductive PEDOT:PSS/Acrylamide organogels

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Gel have enormous applicable region due to inherently high stretchability and bio-compatibility. Here, we fabricated highly stretchable electronic conductive organogels which have long-term stability in environment. By introducing a dialysis step which can incorporate conducting polymer, PEDOT, on the procedure of gel synthesis, residual ions inside the gel were removed. In addition, we replaced the water with organic solvent, EG, inside the gels which is high stability in air. Unlike conventional hydrogels, there are no ionic conduction occurred and electrochemically driven current was prevented during electrical voltage was applied. The fabricated organogels are hardly dried during air exposure, and only electrically conductive without any electrochemical reaction at even high voltage. In order to utilize as stretchable conductor, we demonstrated a LED array circuit using the conductive organogels as electrical interconnects. It was successfully operative even stretched up to 300% strain.

Keywords: PEDOT:PSS organogel, stretchable electronic conductor, strain insensitivity, environmental stability.