

Ethylenedioxythiophene (EDOT)-based copolymer obtained via 'click' synthesis as electroactive material with high solubility and fast response

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A new type of electroactive copolymeric material based on organic monomers was synthesized via 'click' reaction strategy. Azide-functionalized tetraethylene-glycol and alkyne-functionalized 3,4-ethylenedioxythiophene (EDOT) were allowed to undergo copper-catalyzed alkyne-azide cycloaddition reaction to produce a new copolymer. EDOT-co-1,2,3-triazole-4-tetraethylene showed enhanced solubility in organic solvents compared to homopolymer PEDOT. It also showed remarkable reversibility switching between oxidized and reduced state and relatively fast response time. This electroactive material also showed excellent electrochemical, physical and thermal stability. With further tuning, this new material offers new perspective to practically and easily make films and ultra-thin electroactive layers for various applications like sensors and functional organic electronic devices