Poly(Ethylene Oxide)

Subjects: Polymer Science

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Poly(ethylene oxide) is a polyether with a repeat unit of two carbons and one oxygen, and it is unusual in being soluble in both water and several organic solvents. The ether oxygen coordinates cations, which is why the polymer can dissolve a lithium salt and conduct ions in the amorphous phase [1]. Crystallinity blocks conduction, so the conductivity falls sharply above a salt concentration that favours crystalline complexes [2]. The melting point is around 65 degrees Celsius and the glass transition is well below room temperature, so the amorphous fraction is substantial at service temperature [3]. Blending with a second polymer or with a nanoparticle suppresses crystallisation and raises the conductivity [4]. The same coordination makes the polymer a steric stabiliser and a flocculant for clay suspensions [5].

polyether | lithium ion conduction | crystallinity | glass transition | polymer electrolyte | steric stabilizer | salt complex

Synthesis and properties of polymers·Polymers and Plastics·Materials Science·Physical Sciences

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