

ABSTRACT

Disclosed is a novel hybrid polymeric electrolyte formed of a closed-cell cellular polymer foam impregnated with a non-aqueous electrolytic liquid, which comprises a plurality of closed cells defined by cell walls constituting a continuous solid-phase matrix which is impregnated with the non-aqueous electrolytic liquid to form a continuous solid-phase domain, in which the plurality of closed cells are substantially filled with a non-aqueous electrolytic liquid to form a plurality of liquid phase domains which are dispersed in the above-mentioned continuous solid-phase domain. The hybrid polymeric electrolyte of the present invention has not only high ionic conductivity and high mechanical strength, but also has the ability to prevent the non-aqueous electrolytic liquid from leakage, so that the electrolyte of the present invention can be advantageously used in various non-aqueous electrochemical devices. That is, the non-aqueous electrochemical device comprising the hybrid polymeric electrolyte of the present invention exhibits not only excellent electrochemical performance, but also has high ability to retain an electrolytic liquid therein, so that the electrochemical device has excellent safety and is highly reliable in practical use thereof.