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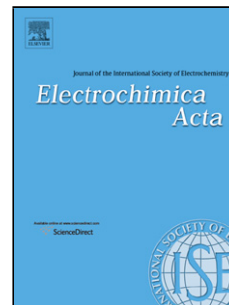
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## Composite gel polymer electrolyte with modified silica for $\text{LiMn}_2\text{O}_4$ positive electrode in lithium-ion battery

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### Highlights

- Paper describes properties of gel electrolyte based on PAN with TMS and modified  $\text{SiO}_2$ .
- It has been showed some of physicochemical properties of the  $\text{SiO}_2$  oxide composite precipitated in the emulsion system and used as the fillers.
- It has shown that capacity of the  $\text{LiMn}_2\text{O}_4$  cathode depends on the current rate.
- For PE3 electrolyte was obtained practical capacity more than 95% of the theoretical capacity.

### Abstract

This paper demonstrates a new modified precipitated silica ( $\text{SiO}_2$ ) and PAN/TMS – poly(acrylonitrile)/sulfolane – polymeric matrix as a composite gel polymer electrolyte for a lithium-ion battery. Synthetic inorganic material was obtained by the emulsion method with cyclohexane as the organic phase and sodium silicate solution as a precipitating agent. The characterisation included determination of dispersion and morphology of the systems (particle size distribution, scanning electron microscope images), as well as impedance analysis, cyclic

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