

# Lithium chemical diffusion coefficients in poly(ethylene oxide)-molybdenum sulfide nanocomposites

González,

Santa Ana,

Benavente,

The intercalation of poly(ethylene oxide) (PEO) in molybdenum sulfide ( $\text{MoS}_2$ ) forms the nanocomposites  $\text{Li}_x\text{MoS}_2(\text{PEO})_{0.5}$  and  $\text{Li}_x\text{MoS}_2(\text{PEO})_{1.0}$ . The lithium ion diffusivity in PEO-containing phases, which depends on both PEO and lithium content, is always higher than in pure  $\text{MoS}_2$ . The maximal observed diffusivity values, but also the strongest dependence on lithium concentration, are observed for  $\text{Li}_x\text{MoS}_2(\text{PEO})_{0.5}$ , possibly due to their relatively greater freedom for rearrangement. Lithium diffusion activation thermodynamic parameters indicate a mechanism which appears to be mainly governed by PEO conformational changes caused by the trend of the polymer to coordinate lithium ions. © 1997 Elsevier Science Ltd. All rights reserved.