

S24: Metal-Organic (MOFs) and Covalent Organic Frameworks (COFs)

PP-324:

PROTON CONDUCTIVITY OF LANTHANIDE NITRILOTRIS-METHYLPHOSPHONATES

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Multifunctional metal phosphonates are acidic coordination polymers (CPs) with remarkable stability and proton conducting properties owing to their structure is usually composed of extended hydrogen-bond networks that favor proton transfer pathways [1].

In this communication, three different families of proton conductors based on lanthanide nitrilotris-methylphosphonates are examined. Compounds were isolated by crystallization at room temperature at pH <0.8 in the presence of. When chloride is presented in solution two families of compounds were isolated, depending on the concentration of chloride in solution: free-chloride 1D solids with formula $\text{Ln}_2(\text{H}_3\text{NMP})_2(\text{H}_2\text{O})_4 \cdot 4.5\text{H}_2\text{O}$ [Ln= La³⁺] [2] or layered chloride-containing $\text{Ln}(\text{H}_4\text{NMP})(\text{H}_2\text{O})_2\text{Cl} \cdot 2\text{H}_2\text{O}$ [Ln= La³⁺ - Ho³⁺] materials [3]. In absence of chloride, a third series of compounds was obtained. This structural versatility leads to a wide range of proton conductivity varying between $3 \times 10^{-4} \text{ S}\cdot\text{cm}^{-1}$ and $2 \times 10^{-3} \text{ S}\cdot\text{cm}^{-1}$ as measured at 80 °C and 95% RH.

Referencias

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