

## TRANSITION METAL HYDROXYPHOSPHONOACETATES AS PRECURSORS OF ELECTROCATALYSTS

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**Abstract:** Coordination polymers (PCs) are widely studied due to their applicability in many fields [1]. Among them, metal phosphonates are attractive materials due to their great structural and functional diversity, as proton conductors and/or precursors of electrocatalysts [2], alternative to the high-cost commercial catalysts based on noble metals [3], for both, PEMFCs and electrolytic systems.

In this research-work, we report the synthesis, characterization and electrochemical properties of several coordination polymers derived from (R,S)-2-hydroxyphosphonoacetic acid (HPAA) with transition metals ( $M^{II} = Fe, Co, Mn, Ni$ ) as well as their solid solutions. The precursor PCs decompose, upon heating in different conditions, to the corresponding metal oxalate solid solutions, which are then used as intermediate materials for obtaining new Non-Precious Metal Electrocatalysts (NPMCs), by pyrolytic treatment at different temperatures under  $N_2/H_2$  atmospheres. The electrochemical behavior of these compounds, regarding to the Oxygen Evolution and Reduction Reactions (OER and ORR, respectively), show that the structural features are of considerable importance as to their electrocatalytic activities.

**Key words:** Coordination Polymers, Metal Phosphonate, Electrocatalyst, Oxygen Evolution Reaction, Oxygen Reduction Reaction.

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