



## **Synthesis and Characterization of Gluconate Salts as Aqueous Corrosion Inhibitors for Mild Steel and 2024, 6061, and 7075 Aluminium Alloys**

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**Abstract:** In this investigation, synthesis and characterization of environmentally friendly metallo-organic corrosion inhibitors for protection of mild steel and certain aluminium alloys are being sought to replace hexavalent chromium based corrosion inhibitors. For this reason, several corrosion inhibiting species such as hydroxyacids and metal oxyanions were combined in a single compound with the general formula,  $(M)_x(\text{hydroxyacid})_y(M'_aO_b)_z$ . These were tested alongside the individual components in order to determine whether there were any synergistic interactions. It is important to note that most of the chosen individual components are corrosion inhibitors that were previously commercialized. Some of these species such as gluconates were commercially available resulting in their direct use with no synthesis required. The common commercial use for these readily available gluconates is in the field of medicinal health as nutritional supplements. Such gluconates of zinc, calcium, magnesium and sodium were used and tested throughout this study as corrosion inhibitors, precursors, or constituents of synergistic corrosion inhibitor formulations.

**Key words:** *Characterization, synergistic, carcinogenic, precursor*

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