Rice Bran as Source for the Synthesis of Imidazoline-type Inhibitors: Synthesis and Corrosion Performance

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Based on its high oil content, this research proposes the use of an agro-industrial by-product (rice bran) as a sustainable option for the synthesis of environmentally friendly corrosion inhibitors. The extraction and characterization of the raw rice bran oil was carried out, and the imidazoline-type inhibitors were synthesized from a 1:3 molar ratio (oil:aminoethylethanolamine). The corrosion inhibitory capacity of the product obtained was evaluated by electrochemical techniques such as potentiodynamic polarization curves and real-time corrosion monitoring. The inhibitory capacity of the synthesized compound was evaluated on an API X-70 steel using a saline solution (3.5% wt. NaCl) saturated with CO₂. The evaluation was performed at three temperatures (30, 50 and 70 °C) and different concentrations of inhibitor (0, 5, 10, 25, 50 and 100 ppm). The results showed that the sustainable use of agro-industrial by-products is a good alternative for the synthesis of environmentally friendly corrosion inhibitors with high inhibition efficiencies.

Keywords: Green inhibitor, Rice Bran, Raw Oil, CO₂ corrosion, Imidazoline.

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