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# Improving the Water Dissociation Efficiency in a Bipolar Membrane with Amino-functionalized MIL-101

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## Abstract

As a crucial part of a bipolar membrane electro dialysis, the optimization of bipolar membranes is of great significance. In this work, a bipolar membrane using Fe-MIL-101-NH<sub>2</sub> as its interfacial layer was initiated, and the effect of the concentration of sprayed Fe-MIL-101-NH<sub>2</sub> was fully investigated from the viewpoints of electrochemical impedance spectroscopy (EIS) and current-voltage (I-V) curves. The results show that Fe-MIL-101-NH<sub>2</sub> can accelerate water splitting in bipolar membranes and that the loading amount of Fe-MIL-101-NH<sub>2</sub> at the interface significantly affects the membrane performance; an appropriate loading concentration of 0.1 g/L can facilitate the formation of a neat cross-surface between the anion and cation layers and helps to achieve the best membrane performance.

## Keywords

Fe-MIL-101-NH<sub>2</sub>; interfacial layer; water dissociation; bipolar membrane;

## 1. Introduction

A bipolar membrane is a composite membrane that consists of an anion-exchange layer, a cation-exchange layer and an interfacial layer between them. A typical

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