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# Post-synthetic Modification of Mesoporous Zinc-Adeninate Framework with Tris(2,2'-bipyridine) Ruthenium(II) Complex and its Electrochemiluminescence

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## Abstract

Herein we report a redox-active metal-organic framework (MOF) via post-synthetic cation exchange with tris(2,2'-bipyridine) ruthenium(II) complex ( $\text{Ru}(\text{bpy})_3^{2+}$ ). A porous anionic zinc-adeninate framework

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(bMOF-5) is spacious enough to easily entrap 2.43 of  $\text{Ru}(\text{bpy})_3^{2+}$  cations within the mesopore. The encapsulation supported the framework structure preventing any distortion from a rapid solvent evaporation under SEM observation.  $\text{Ru}(\text{bpy})_3^{2+}@\text{bMOF-5}$  was then immobilized on the surface of glassy carbon electrode, and its electrocatalytic and electrochemiluminescent (ECL) properties were investigated in aqueous and organic solution. Especially,  $\text{Ru}(\text{bpy})_3^{2+}@\text{bMOF-5}$  showed the excellent electrochemical properties of  $\text{Ru}(\text{bpy})_3^{2+}$ , but gradual decomposition of the MOF structure was observed under electrochemical measurements because of the sluggish oxidation of adeninate ligand.

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