



Coordination chemistry of silver(I), gold(I) and nickel(II) with bis *N*-heterocyclic carbenes: applications in electrocatalytic hydrogen evolution reaction

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ABSTRACT

The design and systematic investigation of an electrocatalyst is crucial in ensuring proper benchmarking of the catalyst developed. This perspective has led to molecular catalysts developed from *N*-heterocyclic carbene (NHC) metal complexes for electrocatalytic applications. Among the array of electrocatalytic applications available, hydrogen evolution reaction (HER) is at the forefront due to the ever-increasing demand for cleaner and sustainable energy. This work is focussed on the development of binuclear metal-NHC complexes from bis-{4-(2,6-diethylphenyl)-1,2,4-triazole} with a propyl spacer and hexafluorophosphate counterion. The NHC precursor and binuclear silver complexes prepared have been elucidated by single-crystal X-ray diffraction. An assessment of the binuclear complex bearing the same ligand with nickel(II) resulted in the formation of a counter held nickel derivative. The electrocatalytic performance of these metal organic derivatives in HER is evaluated along with their electrochemical impedance spectral discussion.

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