

ABSTRACT

Luminescent metal organic frameworks (LMOFs) have gathered the attention of many researchers in the past two decades due to their significant applications in energy storage and conversion, catalysis, chemical sensing and solid-state lighting. Benefiting from 4,7-dibromo-2H-benzo[d][1,2,3]triazole, which has tunable electron-withdrawing properties, MOFs with efficient water-splitting applications were synthesised. Starting from 2,1,3-benzothiadiazole precursor, ligand 4,4'-(2H-benzo[d][1,2,3]triazole-4,7-diyl)dibenzoic acid was synthesised. The characterization of 4,7-dibromo-2H-benzo[d][1,2,3]triazole ensured the formation of the triazole ring, thus leading to the synthesis of the desired ligand. Additionally, computational studies were also performed to get deeper insight into the properties of the ligand. Later, its MOF with Zn metal was prepared, and its catalytic application in water splitting was investigated. The ECSA was found out to be 210 cm², indicating numerous active sites on ligand. The prepared MOF exhibited excellent properties in electrochemical applications.