Metal-Organic Framework-derived synthesis of MoO₂-Cu@NC nanocomposites for enhanced lithium storage properties

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As advanced electrode materials for lithium ion batteries, the application of molybdenum dioxide (MoO₂) is hampered by poor cycle stability and rate performance. In this work, a novel Mo/Cu metal organic framework (MOF) has been synthesized using nitrogen-rich folic acid (FA) as an organic ligand through liquid-phase method for the first time at room temperature. After a simple annealing treatment, MoO₂-Cu@nitrogen-doped carbon (NC) nanomaterials derived from the Mo/Cu based MOF were obtained, which exhibit excellent performance as the anode material for lithium-ion batteries. The reversible discharge capacity of MoO₂-Cu @NC nanocomposites exceeds 1000 mAh g⁻¹ at 100 mA g⁻¹, which remains 846 mAh g⁻¹ after 100 cycles. Meanwhile, the obtained MoO₂-Cu@NC nanocomposites also show good rate performance (580 mAh g⁻¹ at 1000 mA g⁻¹).

Keywords: Metal organic framework (MOF); MoO₂; Folic acid; Lithium ion batteries

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