Short Communication

A high-capacity catechol-based cathode material for rechargeable lithium-ion batteries

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Using facile acetylene trimerization as a key step, six catechols were congregated on one benzene core to develop a star-shaped redox-active molecule, namely, 3',4',5',6'-tetrakis(3,4-dihydroxyphenyl)-[1,1':2',1''-terphenyl]-3,3'',4,4''-tetraol, which was termed Cat₆B. Cat₆B demonstrated as a promising cathode material for lithium ion battery with extreme low solubility, good cycling stability, and high theoretical specific capacity (442 mAh/g). An initial discharge specific capacity up to 305.2 mAh/g@50 mA/g and an energy density of 671 Wh/kg were achieved.

Keywords: organic cathode; catechol; lithium-ion batteries; acetylene trimerization

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