# Fabrication of highly-packed, crack-free sulfur electrodes by scaffold-supported drying for ultrahigh-sulfur-loaded lithium sulfur batteries

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Despite notable progresses of rechargeable lithium sulfur (Li-S) batteries during the past decade, achieving high performances with high sulfur-loaded sulfur cathodes remains a key challenge for the commercialization of practical Li-S batteries. This paper presents a novel method to fabricate a crack-free sulfur electrode of an ultrahigh sulfur loading (16 mg $cm^{-2}$) and a high sulfur content (65 %). By introducing a porous scaffold on the top of the cast of sulfur cathode slurry, the crack formation during the drying of the cast can be prevented. The scaffold-supported sulfur cathode delivers a notable high capacity of 10.3 mAh $g^{-1}$ at the $80^{th}$ cycle, demonstrating that the crack-free structure renders more uniform redox reaction at such high sulfur loading. The highly-packed feature of the sulfur cathode is advantageous in reducing the amount of electrolyte which additionally contributes to high energy density. Therefore, the scaffold-supported fabrication provides an effective route to design a practically viable, energy-dense lithium sulfur battery.