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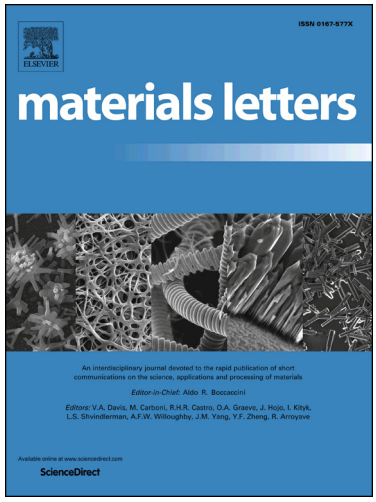

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Yeast-derived active carbon as sustainable high-performance electrodes for Lithium–oxygen batteries

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Abstract

Here, we report a high performance biomass-derived cathode material. Compared to traditional carbon materials, biomass-derived carbon, prepared through the pyrolysis of yeast followed by activation with KOH, shows a great improvement in both catalytic activity and stability. A lithium–oxygen battery that uses the yeast-derived carbon as its cathode presents a discharge capacity of 22100 mAh g^{-1} at 570 mA g^{-1}, and sustains more than 500 cycles at a fixed capacity of 1360 mAh g^{-1}. Moreover, the rate capability reaches as high as 3390 mA g^{-1}, a value which is nearly an order of magnitude higher than that of conventional lithium–oxygen batteries. This work will provide a new direction for choosing cathode material for energy conversion and storage.

Key words: *Lithium–air batteries, Yeast, Carbon materials, Biomass, Biomaterials*

1. Introduction

With the development of science and technology, human's energy consumption is growing rapidly, which is projected to be 42 TW by 2050 [1]. Batteries with larger capacity are in great need to satisfy mankind's rising desire. Non-aqueous

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