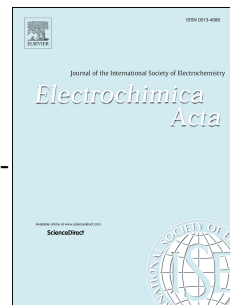


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# S-doped CQDs tailored transparent counter electrodes for high-efficiency bifacial dye-sensitized solar cells

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**Abstract:** Bifacial photovoltaics are promising devices for significantly harvesting solar energy and generating power from either front or rear side. We present here the fabrication of new category of high-performance bifacial dye-sensitized solar cells (DSSCs) tailored with transparent S-doped carbon quantum dots (S-CQDs)/metal selenide counter electrodes. Arising from photoexcitation of S-CQDs and therefore increased electron density at electrode surfaces, the catalytic ability of S-CQDs tailored counter electrodes is markedly enhanced under solar irradiation. The bifacial DSSCs yield maximized front and rear efficiencies of 9.15% and 6.26%, respectively.

**Keywords:** Dye-sensitized solar cells; Alloy counter electrodes; Carbon quantum dots; Photovoltaics

## 1. Introduction

Dye-sensitized solar cells (DSSCs) have attracted considerable interests since prototype from O'Regan and Grätzel in 1991 [1-3], arising from their easy fabrication, cost-effectiveness, high power conversion efficiency in theory, and low-environmental impacts in comparison with silicon

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