

## Efficient Iodine-Free Dye-Sensitized Solar Cells Using Carbon Nanotubes as Cathodes

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Vertically aligned single-walled carbon nanotubes (VASWCNTs) have been successfully transferred onto transparent conducting oxide glass and implemented as efficient low-cost, platinum-free counter electrode in iodine- and sulfide-mediated dye-sensitized solar cells (DSCs). Comparable catalytic activity was observed in the VASWCNTs toward  $I_3^-/I^-$  electrolyte with respect to Pt counter electrode. Impressively, such VASWCNTs electrode demonstrated a remarkably enhanced electrocatalytic activity toward thiolate/disulfide redox shuttle over conventional Pt counter electrodes, and an unprecedented charge transfer resistance of only  $6 \Omega \text{ cm}^{-2}$  towards aqueous polysulfide electrolyte. Therefore, VASWCNTs counter electrodes are believed to be a versatile candidate for further improvement of the power conversion efficiency of other iodine-free redox couple based DSCs and polysulfide electrolyte based QDSCs.

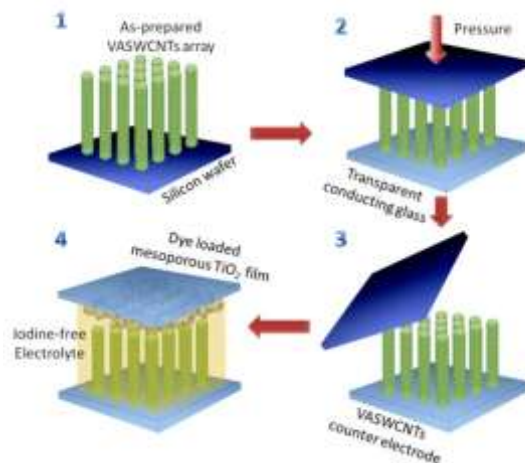


Figure 1. Schematic image of the preparing VASWCNTs-based DSCs.

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### References:

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