

# Photoluminescent argan waste derived Carbon Nano Dots embedded in polymer matrices as photonic conversion layers for solar PV cells

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**Abstract:** In this work, photoluminescent (PL) Carbon Nano Dots (CNDs) prepared from argan waste were embedded in highly optical transparent Poly(styrene-co-acrylonitrile) (PSA) and Cyclo-Olefin Copolymer (COC) matrices which were further processed in thin films. In the first step the luminescent CNDs were prepared through thermal processing of fine grinded argan waste followed in the second step by direct dispersion in the polymer solutions obtained by solving PSA and COC in selected solvents. These two polymer matrices were selected due to their high optical transparency, resilience to various environmental factors and ability to be processed as quality thin films. The structural configuration of the CNDs was investigated through EDX, XPS and FTIR while DLS and HR-SEM were used for their morphology investigation. The luminescence of the prepared CNDs and resulted polymer nanocomposites was thoroughly investigated through Steady State, absolute PLQY and Lifetime fluorescence. The quality of the resulted CNDs-polymer nanocomposites thin films was evaluated through AFM. The prepared highly luminescent thin films with a PL conversion efficiency of 30% are intended to be applied as outer photonic conversion layers on solar PV cells for increasing their conversion efficiency through valorization of the UV component of the solar radiation.