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(54) **PHOTOVOLTAIC DEVICES EMPLOYING
TERNARY COMPOUND NANOPARTICLES**

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(57) **ABSTRACT**

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The present invention provides a photovoltaic device. In an exemplary embodiment, the photovoltaic device includes a substrate having a thin film disposed thereon, where the thin film includes alloyed ternary nanocrystals. The present invention provides also provides a method of making ternary compound nanocrystals. In an exemplary embodiment, the method includes (1) degassing a solution of PbO, oleic acid and 1-octadecene (ODE) in a container, (2) heating the solution in the container, (3) injecting a first mixture of trioctylphosphine (TOP):Se solution, TMS₂S, diphenylphosphine (DPP) and ODE into the heated solution, thereby forming a second mixture in the container, (4) adding ODE to the second mixture in the container, (5) growing the nanocrystals in the second mixture in a reaction in the container, and (6) quenching the reaction, thereby resulting in precipitated nanocrystals in the container. In a further embodiment, the present invention further includes purifying the precipitated nanocrystals.

