



Studies on Pr³⁺-Yb³⁺ codoped ZBLA as rare earth down convertor glasses for solar cells encapsulation

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Auteur	Merigeon, Julien [1], Maalej, O. [2], Boulard, Brigitte [3], Stanculescu, Anca [4], Leontie, Liviu [5], Mardare, Diana [6], Girtan, Mihaela [7]
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Résumé en anglais	<p>The non-absorption of photons with energies below the bandgap (E_g) and the thermalization of photons with energies higher than E_g are the dominant loss processes of single-junction solar cells. Rare earth doped glasses give the opportunity to convert the incident photons wavelength and hence to increase or decrease their energies. The conversion of photons energies by "up or down conversion" leads to the possibility to increase the efficiencies of all classes of single-junction solar cells. Depending on the nature of doping materials, two low energy photons can be converted into one high-energy photon (up-conversion), or one high energy photon, can be converted into two low energy photons (down-conversion). In this paper, Pr³⁺-Yb³⁺ down-conversion co-doped ZBLA glasses were tested as encapsulation materials for silicon solar cells. The J-V characterizations were done under solar simulator irradiation. The influence of Yb³⁺ concentration on the solar cells performances was investigated, showing that an optimum value between 0.5 and 2 mol% conducts to an increase of the device efficiency comparing to mono-doped ZBLA material.</p>
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Titre abrégé	Opt. mater.

Liens

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