



Rare-earth-activated glasses for solar energy conversion

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Résumé en anglais The solar cells efficiency may be improved by better exploitation of the solar spectrum, making use of the down-conversion mechanism, where one high energy photon is cut into two low energy photons. The choice of the matrix is a crucial point to obtain an efficient down-conversion process with rare-earth ions. When energy transfer between rare earth ions is used to activate this process, high emission and absorption cross sections as well as low cut-off phonon energy are mandatory. In this paper we present some results concerning 70SiO₂-30HfO₂ glass ceramic planar waveguides co-activated by Tb³⁺/Yb³⁺ ions, fabricated by sol gel route using a top-down approach, and a bulk fluoride glass of molar composition 70ZrF₄ 23.5LaF₃ 0.5AlF₃ 6GaF₃ co-activated by Pr³⁺/Yb³⁺ ion. Attention is focused on the assessment of the energy transfer efficiency between the two couples of rare earth ions in the different hosts.

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