

Abstract Submitted
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Development of Phase Stable Organic Photon Upconverters¹

YOICHI MURAKAMI, Tokyo Institute of Technology — Recently, high efficiency photon upconversions (UCs) utilizing triplet-triplet annihilation (TTA) in aromatic hydrocarbon molecules, applicable to sunlight intensity, have been actively studied for the purpose of improving external quantum efficiencies of photovoltaics. These studies have been using volatile organic solvents as media in order for TTA to occur, which are currently hindering its applications. I have discovered that those aromatic molecules can be stably dispersed by a simple method within certain class of ionic liquids (ILs), which are non-volatile and thermally stable up to several hundred degree C, to form unprecedented organic photon upconverters with improved phase stability [1,2]. The proposed mechanism for the molecular stabilization in ILs as well as the UC quantum efficiencies is presented.

[1] Y. Murakami and I. Sato, Patent 2010-230938JP (pending)

[2] Y. Murakami et al., submitted.

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