

Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Effect of Graphene in Quenching Fluorescence from Strained Conjugated Polymer Doped Polystyrene Composite Films¹ XUAN LONG HO, YAN-HAO CHEN, JONATHON DAVID WHITE, NEN-WEN PU, Yuan Ze University, Taiwan, ARNOLD CHANG-MOU YANG, National Tsing Hua University, Taiwan — Introduction of graphene into films and solutions of conjugated polymers has been observed to dramatically quench photoluminescence (PL) of MEH-PPV. In other work, the PL of MEH-PPV well dispersed in an optically inert matrix was seen to be dramatically increased when the individual molecular strands were fully stretched. Strong polarization effects indicated that stretching individual polymer chains was responsible for the observed enhancement. We examine the combined effect of stress and the addition of reduced graphene oxide (rGO) on PL. We found that the addition of a small amount of rGO (0.3%) into polystyrene films lightly doped with 1% MEH-PPV quenched 40% of the PL. Stretching resulted in the creation of local deformation zones (LDZ) of high stress and strain. Within these zones, while the PL efficiency increased dramatically for all films, the effect was greatest for those incorporating rGO. We conclude that the application of stress on the conjugated polymers reduces charge transfer between the polymer and the graphene flakes.

¹Supported by the Ministry of Science and Technology of the Republic of China

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Date submitted: 14 Nov 2014

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