

Abstract Submitted  
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**Study of photo induced optical transparency of I/I<sub>3</sub> redox couple in Dye Sensitized Solar Cells** JOSEF VELTEN, JULIA BYKOVA, JAVIER CARRETERO-GONZALEZ, ELIZABETH CASTILLO MARTINEZ, ANVAR ZAKHIDOV — Dye sensitized solar cells (DSCs) are an alternative to the standard silicon solar cell, consisting of a photoelectrochemical cell that has a light absorbing working electrode, a I-/I<sub>3</sub>- charge mediator and a counter electrode for reduction of I<sub>3</sub>- back to I-. Traditionally, this counter electrode is composed of a few nanometer layer of platinum deposited onto transparent conductive oxide glass. Our work has focused on using structured carbon materials as a counter electrode. Earlier work focused on the use of carbon nanotubes, both single and multiwalled as a replacement for this platinum counter electrode material. Recent work has moved into using 2 dimensional carbon materials, such as graphene flakes and graphene ribbons. With the use of graphene ribbons we have discovered a unique effect that has not been reported for DSCs: under operating condition of AM 1.5 light, the charge mediating electrolyte undergoes a change in its absorption profile. We conclude that this phenomenon must arise from the structure of the graphene ribbons. This process has been demonstrated to be completely reversible, and shows no degradation to the DSC's operation. This presentation will also discuss the application of this phenomenon in the use of inverted DSCs and hybrid tandem cells.

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