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Photophysical and enhanced nonlinear optical response in asymmetric benzothiazole substituted phthalocyanine covalently linked to semiconductor quantum dots**Njemuwa Nwaji, Somila Dingiswayo, John Mack and Tebello Nyokong***

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Abstract

The synthesis of asymmetric benzothiazole substituted phthalocyanine (complexes **3** to **5**) and their covalent attachment to glutathione (GSH) functionalized quantum dots (QDs) are reported in this work. Additionally, their photophysical and nonlinear optical properties were investigated. A decrease in the fluorescence quantum yield with corresponding increase in the triplet quantum yield was observed when the complexes were covalently linked to glutathione (GSH) functionalized cadmium telluride (CdTe) quantum dots. The reverse saturable absorption was found to be predominantly dominated by excited state absorption. The observed limiting threshold values range from 0.29–0.75 J/cm².

Key word: photo-induced energy transfer, ball-type phthalocyanines, quantum dots, photophysics, optical limiting

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