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Title:	'Autophagy' and unique aerial oxygen harvesting properties exhibited by highly photocatalytic carbon quantum dots Author links open overlay panel
Authors:	Mondal, Sanjit (/jspui/browse?type=author&value=Mondal%2C+Sanjit) Gautam, Ujjal K. (/jspui/browse?type=author&value=Gautam%2C+Ujjal+K.)
Keywords:	Carbon dots Oxygen-enrichment
Issue Date:	2021
Publisher:	Elsevier
Citation:	5-Hydroxymethylfurfural
Abstract:	Plastic pollution is a serious threat to the environment as they are not bio-degradable. Herein using waste-polyethylene, we report two inter-related important findings. First that they can be converted economically and completely into highly photocatalytic carbon quantum-dots (CQDs) using H ₂ O ₂ as a residue-free oxidant in an acid medium, and they have the ability to enrich a reaction medium with an extraordinary amount of molecular oxygen harvested from the air so that no separate oxygen source is needed while carrying out facile photocatalytic oxidation reactions. Second, when they are not performing any photocatalytic reaction, they exhibit self-sensitized photo-oxidation to convert themselves completely to CO ₂ in the presence of sunlight, a phenomenon that we term as 'CQD-autophagy' by drawing parallels to the death of useless-cells in the body. Such extinction from the reaction media is unique as no other material is known to do so and advantageous because the removal of carbon-dots from a solution is rather inefficient from an industry-viewpoint due to their high solubility. Instead, the inexpensive CQDs can be discarded casually with the notion that they will gradually get eliminated from the environment.
Description:	Only IISER Mohali authors are available in the record.
URI:	https://www.sciencedirect.com/science/article/abs/pii/S0008622321004371?via%3Dihub (https://www.sciencedirect.com/science/article/abs/pii/S0008622321004371?via%3Dihub) http://hdl.handle.net/123456789/5142 (http://hdl.handle.net/123456789/5142)
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