Title:	Upcycling of Waste-Polyethylene into Luminescent Carbon-Dots : Effect of oxidizing Agents on Their Emergent Properties
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Abstract:	Plastic use, generation of its waste and pollution caused by it is an ever-increasing problem in the modern world. Current large-scale waste management methods, although a step in the right direction, are not as efficient and have their own drawbacks. Polyethylene is the most colloquially used plastic in the world. Here, we convert waste polyethylene into highly luminescent and photocatalytically beneficial Carbon Dots (CDs) with encouraging yield, by a bottom-up process. Prior work in our lab has established novel properties like oxygen harvesting ability, autophagy in CDs and their tunability. CDs, whose structure in general is a graphitic domain laced with various functional groups on the surface, are known to possess unique luminescence and the origins for the same is still under intense research. However, it is apparent that the surface functional groups, and hence the luminescent properties, are tunable by precursors and synthesis conditions. In this work, we attempt to check this hypothesis by using four different oxidizing agents during the synthesis step to form four separate types of CDs. We study their novel properties and the difference among them, and check their viability for a host of photocatalytic applications.
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