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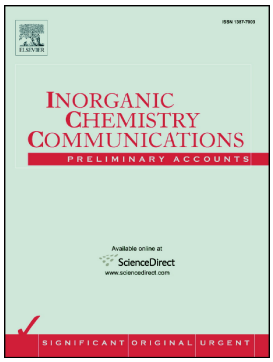

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Carbon quantum dots modified BiOBr microspheres with enhanced visible light photocatalytic performance

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Abstract: Carbon quantum dots (CQDs) modified BiOBr (CQDs/BiOBr) microspheres were successfully prepared via a polyvinyl pyrrolidone (PVP) assisted hydrothermal method. The obtained CQDs/BiOBr photocatalysts exhibited much higher photocatalytic activity than bare BiOBr **and commercial Degussa P25 in photo-degradation of rhodamine B** (RhB) and antibiotic agent ciprofloxacin (CIP) under visible light irradiation. The experimental results indicate that the modification of CQDs can effectively enhance the concentration and the transfer rate of the photogenerated carriers, which is mainly attributed to the superior electron transfer ability and enhanced light harvesting.

Keywords: Carbon quantum dots; BiOBr; visible light; photocatalysis; rhodamine B; ciprofloxacin

1. Introduction

At present, the issues of energy shortages and environmental protection have aroused much attention from the general public [1]. In this regard, semiconductor photocatalysis is considered to be one of the most important solutions to these problems, which can effectively utilize the solar energy to generate hydrogen from water, to decompose the harmful waste into harmless substances, and to transform CO_2 into fuel and valuable chemical feedstocks [2]. Hence, development of highly efficient photocatalysts for the organic pollutants elimination has attracted many interests and numerous efforts have been devoted to exploring highly active visible light-induced photocatalysts.