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Copper porphyrin-based conjugated microporous polymers as photosensitizers for singlet oxygen generation

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Abstract: A copper porphyrin-based conjugated microporous polymer (CuPs-CMP@72h, $S_{\text{BET}} = 1240 \text{ m}^2 \text{ g}^{-1}$) was synthesized, characterized, and further applied as a promising photocatalyst in the oxidation reaction of 1,3-diphenylisobenzofuran to 1, 2-phenylene-bis(phenylmethanone). Furthermore, the effect of metal atom and porosity of the CMP network play an important role on generating the singlet oxygen.

Key words: Porous materials; Conjugated microporous polymers; Polymers; Porphyrin; Photocatalyst; Singlet oxygen

1. Introduction

Conjugated microporous polymers (CMPs) are a new class of porous organic materials with three-dimensional conjugated skeleton. From a porous material perspective, CMPs have shown their great potential for gas adsorption of hydrogen, carbon dioxide, and methane ^[1-3]. From a conjugated polymer perspective, CMPs allow the integration of various building blocks into conjugated network with extended delocalization and exhibit outstanding electronic properties, including light-harvesting antennae, semiconducting, and photoconducting functions ^[4-8]. A significant structural feature of CMPs is that they allow the complementary utilization of porosity and conjugation, leading to a unique molecular platform for developing functional molecular systems. In

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