

# Photocatalytic Synthesis of Phenol by Direct Hydroxylation of Benzene by a Modified Nanoporous Silica (LUS-1) under Sunlight

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- 摘要
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**摘要** Fe-g-C<sub>3</sub>N<sub>4</sub>-LUS-1 was prepared by the thermal decomposition of dicyandiamide inside the pores of LUS-1 under an inert atmosphere. It was used as a photocatalyst for the hydroxylation of benzene to phenol in sunlight. The catalysts were characterized by Fourier transform infrared spectroscopy, N<sub>2</sub> adsorption-desorption, X-ray diffraction, and scanning electron microscopy. In Fe-g-C<sub>3</sub>N<sub>4</sub>-LUS-1, a single layer of graphitic carbon nitride (g-C<sub>3</sub>N<sub>4</sub>) was formed on the surface of LUS-1. The photocatalytic activity of the iron containing g-C<sub>3</sub>N<sub>4</sub> based catalysts was investigated, and the catalytic activity was remarkably enhanced when the reaction condition was changed from dark to sunlight. The best result was obtained with 20%Fe-g-C<sub>3</sub>N<sub>4</sub>-LUS-1 in sunlight.

**关键词:**

**Abstract:** Fe-g-C<sub>3</sub>N<sub>4</sub>-LUS-1 was prepared by the thermal decomposition of dicyandiamide inside the pores of LUS-1 under an inert atmosphere. It was used as a photocatalyst for the hydroxylation of benzene to phenol in sunlight. The catalysts were characterized by Fourier transform infrared spectroscopy, N<sub>2</sub> adsorption-desorption, X-ray diffraction, and scanning electron microscopy. In Fe-g-C<sub>3</sub>N<sub>4</sub>-LUS-1, a single layer of graphitic carbon nitride (g-C<sub>3</sub>N<sub>4</sub>) was formed on the surface of LUS-1. The photocatalytic activity of the iron containing g-C<sub>3</sub>N<sub>4</sub> based catalysts was investigated, and the catalytic activity was remarkably enhanced when the reaction condition was changed from dark to sunlight. The best result was obtained with 20%Fe-g-C<sub>3</sub>N<sub>4</sub>-LUS-1 in sunlight.

**Keywords:**

收稿日期: 2012-01-21; 出版日期: 2012-07-31

**引用本文:**

Ghasem SHIRAVAND, Alireza BADIEI, Ghodsi Mohammadi ZIARANI等 .Photocatalytic Synthesis of Phenol by Direct Hydroxylation of Benzene by Modified Nanoporous Silica (LUS-1) under Sunlight[J] 催化学报, 2012,V33(8): 1347-1353

Ghasem SHIRAVAND, Alireza BADIEI, Ghodsi Mohammadi ZIARANI etc .Photocatalytic Synthesis of Phenol by Direct Hydroxylation of Benzene by Modified Nanoporous Silica (LUS-1) under Sunlight[J] Chinese Journal of Catalysis, 2012,V33(8): 1347-1353

**链接本文:**

http://www.chxb.cn/CN/10.1016/S1872-2067(11)60422-1 或 http://www.chxb.cn/CN/Y2012/V33/I8/1347

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