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## Graphene Oxide Template-confined Fabrication of Hierarchical Porous Carbons Derived from Lignin for Ultrahigh-efficiency and Fast Removal of Ciprofloxacin

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### Abstract

Here, a new hierarchical porous carbon was first prepared from sodium lignosulphonate (SLS), an industrial by-product, *via* a confined carbonization and alkali activation methods using graphene oxide (GO) as template, and was used for ciprofloxacin (CIP) removal. The addition of GO nanosheets remarkably affected the morphology and pore structure. GLHPC-1, obtained at GO/SLS weight ratio of 1:100, possess a largest specific surface area of 3223 m<sup>2</sup> g<sup>-1</sup> and pore volume of 2.275 cm<sup>3</sup> g<sup>-1</sup>, and thus exhibited an ultrahigh adsorption of 980.4 mg g<sup>-1</sup> at 318 K and fast adsorption rate, as well as a good recycle ability in practice.

**Keywords:** Hierarchical porous carbon, Confined Template, Graphene oxide, SLS, Adsorptive removal, Ciprofloxacin

### 1. Introduction

Porous carbon materials have drawn more attention in recent years, because of their outstanding textural properties, favorable surface function groups, and high stability, and have

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