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# In-situ gelation of sodium alginate supported on melamine sponge for efficient removal of copper ions

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## ABSTRACT

Sodium alginate-melamine sponge composites were fabricated by in-situ gelation of sodium alginate supported on the commercial melamine sponge (MS). MS serves as the three-dimensional skeleton for alginate coating and can effectively avoid the shrink of alginate, and thus makes the alginate-MS composites user-friendly and facile to recover. In the adsorption test, the adsorption process is pseudo-second order and matches the Langmuir model with the maximum adsorption capacity of 90.1 mg/g for copper ions. The alginate-MS is recyclable and presents enhanced mechanical properties compared with those of pristine MS. All these properties make such alginate-MS a promising candidate as an adsorbent for heavy metal removal.

**Keywords :** Melamine sponge; Sodium alginate; Cu(II) removal; Water treatment

## 1. Introduction

Heavy metal ions in industrial waste water become a serious threat to wildlife and human health due to their high toxicity and non-biodegradability [1-3]. The efficient removal of heavy metal ions from water is among the most important issues in the study of water/wastewater treatment [4, 5]. The current technologies to remove heavy metal ions from water include chemical precipitation, adsorption, membrane filtration and so on [6], of which adsorption is the most popular approach because of its high efficiency and easy operation [7,8]. Nowadays, many adsorbents have been

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