

不同化肥对水稻土中Cu吸附行为的影响

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Effects of Fertilizers on Cu Adsorption in Paddy Soil

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摘要

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摘要 通过等温吸附试验,研究Ca(NO₃)₂、NH₄Cl、NH₄NO₃、CO(NH₂)₂、KH₂PO₄和KCl 6种化肥对土壤中Cu吸附行为的影响。结果表明,添加CO(NH₂)₂使土壤中Cu的吸附率和分配系数增大,NH₄NO₃、KCl、NH₄Cl和Ca(NO₃)₂则使其明显减小,KH₂PO₄对土壤Cu吸附的影响作用与Cu离子浓度有关。不同化肥处理土壤中Cu的吸附势E₀顺序为:CO(NH₂)₂>CK>NH₄NO₃>Ca(NO₃)₂>KCl>NH₄Cl>KH₂PO₄。6种化肥对土壤中Cu吸附行为的影响作用为:KH₂PO₄>CO(NH₂)₂>CK>NH₄NO₃>KCl>NH₄Cl>Ca(NO₃)₂。由于不同化肥对土壤中Cu吸附行为的影响不同,因此在Cu含量较高的土壤上种植时应合理选择施用化肥,以避免土壤中Cu的迁移转化,降低其生物有效性。

关键词: 化肥 水稻土 重金属 Cu 吸附

Abstract: Six types of fertilizers, i.e. Ca(NO₃)₂, NH₄Cl, NH₄NO₃, CO(NH₂)₂, KH₂PO₄ and KCl, were used in an isothermal adsorption experiment to study effects of fertilizers on Cu adsorption behaviors in soil. Results show that application of CO(NH₂)₂ increased adsorption ratio and distribution coefficient of Cu, but the application of NH₄NO₃, KCl, NH₄Cl or Ca(NO₃)₂ demonstrated an obviously reverse effect; the effect of KH₂PO₄ was related to Cu concentration. Cu adsorption potential E₀ varied with fertilizer treatments, following an order of CO(NH₂)₂ > CK (control groups) > NH₄NO₃ > Ca(NO₃)₂ > KCl > NH₄Cl > KH₂PO₄. The effects of the six types of fertilizers on Cu adsorption behaviors followed the order of KH₂PO₄ > CO(NH₂)₂ > CK > NH₄NO₃ > KCl > NH₄Cl > Ca(NO₃)₂. Because of the different effects of the fertilizers on Cu adsorption, reasonable choice should be made as to what type of fertilizer is to be used during crop cultivation season in the soil high in Cu content in order to avoid Cu mobilization transformation and decrease its bio-availability.

Keywords: fertilizer paddy soil heavy metal Cu adsorption

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