土 壤 学 报
ACTA PEDOLOGICA SINICA
Turang xuebao

李保同,Ren Yonglin,曾鑫年.氰在土壤中的吸附与转化[J].土壤学报,2013,50(2):237-243.Li Baotong,Ren Yonglin and Zeng Xinnian.Adsorption and transformaton of cyanogen in soil[J].Acta Pedologica Sinica,2013,50(2):237-243

二维码（扫一下试试看！）

氰在土壤中的吸附与转化

Adsorption and transformaton of cyanogen in soil

投稿时间： 2012-07-19 最后修改时间： 2012-11-10

DOI：10.11766/trxb201207190289

中文关键词： 氰(C_2N_2) 熏蒸剂 转化 土壤 氰化氢(HCN)

Key Words:Cyanogen (C_2N_2) Fumigant Conversion Soil Hydrogen cyanide (HCN)

基金项目:国家自然科学基金资助项目(30960081)；江西省自然科学基金项目(20114BAB204010)资助

作者	单位	E-mail
李保同	江西农业大学农学院	libt66@163.com
Ren Yonglin	Cooperative Research Centre For National Plant Biosecurity,LPO Box ,Bruce,ACT ,Australia	
曾鑫年	华南农业大学农药与化学生物学教育部重点实验室	

中文摘要:

氰(C_2N_2)是一种具有替代溴甲烷潜力的新熏蒸剂，明确C_2N_2在土壤中的吸附与转化行为对C_2N_2的安全应用具有重要的意义。利用静态法研究了C_2N_2在土壤中的吸附与转化过程，土壤对C_2N_2的吸附速率与土壤的理化性质有关，受环境温度、土壤含水量和土壤生物的影响较少，与熏蒸浓度无关。采用气相色谱(GC)和流动注射分析仪(FIA)测定了土壤对C_2N_2的吸附率和C_2N_2在土壤中的可能转化产物。结果表明，土壤对C_2N_2的吸附能力很强，熏蒸2 h吸附率在75%以上，熏蒸24 h 吸附率在98%以上，并可快速转化为HCN、NH_4^+和NO_3^-。其中，大约20%的C_2N_2转化为NH_4^+和NO_3^-，13%的C_2N_2转化为HCN。熏蒸48 h未检测到NO_2^-。HCN在土壤中不稳定，可进一步转化为其他含氮化合物。

Abstract:

Cyanogen (C_2N_2) is a new type of fumigant that has the potential to replace methyl bromide. So it is of important significance to ascertain the behaviour of C_2N_2 in adsorption and transformation in soil for its safety application. Adsorption and transformation of C_2N_2 in soil was investigated using the static method under controlled conditions. C_2N_2 adsorption rates in soil was related with physicochemical properties of the soil, and slightly related with the ambient temperature, the soil water content and soil organisms, but not related with the application rate of the fumigant. C_2N_2 adsorption rate and its possible transformation products (HCN, NH_4^+, NO_3^- and NO_2^-) were determined using the gas chromatography (GC) coupled with a nitrogen-phosphorus detector (NPD) and the flow injection analyzer (FIA) with a Photometric detector. Results show that the soil had a very high C_2N_2 adsorption capacity with a rate being over 75% within 2 h of fumigation and over 98% within 24 h. The absorbed C2N2 could be quickly transformed, about 13% into HCN, and 20% into NH_4^+ and NO_3^-. No $NO_2^-$was detected within 48 h. HCN in soil was not stable and could be further transformed into other nitrogenous compounds.

查看全文 查看/发表评论 下载PDF阅读器