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3种人工湿地基质对磷的吸附特性

Characteristics of phosphorous adsorption on three substrates used in constructed wetland

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中文摘要：

　　选用页岩、陶粒和砾石3种基质进行等温吸附和吸附动力学试验,研究其对磷的吸附特性。结果表明,Freundlich和Langmuir方程均能较好地拟合各基质对磷的吸附特征,并且用Freundlich方程的拟合效果要好于Langmuir方程;基质对磷的理论饱和吸附量大小依次为页岩(527.992 mg/kg)>陶粒(328.165 mg/kg)>砾石(129.729 mg/kg);页岩最大磷吸附量随粒径增加而减小;各基质对磷的吸附过程分为快、中、慢3个阶段,3种基质对磷的吸附速率依次为页岩>陶粒>砾石;准二级动力学方程、双常数方程和Elovich方程均能较好地描述人工湿地基质对磷的吸附动力学特征,但从相关系数来看,准二级动力学方程的描述更为准确。

英文摘要：

　　The phosphorous adsorption characteristics of three substrates (shale,haydite,gravel) in constructed wetland were studied by isotherm adsorption and adsorption kinetics experiment.The results showed that both Freundlich and Langmuir equations were well fitted for describing the adsorption characteristics of these substrates.To simulate the equilibrium phosphorous adsorption data,the Freundlich equation was better than the Langmuir equation.The maximum phosphorus adsorption capacity of shale increased as the grain size of the material decreased.The phosphorous theoretical saturated adsorption capacity of three substrates followed the order shale (527.992 mg/kg)> haydite (328.165 mg/kg)>gravel (129.729 mg/kg).The process of adsorption could be divided into fast,middle and slow stages.The rate of adsorption followed that shale > haydite >gravel.Pseudo second order kinetics,dual constant and Elovich equations could be suitable to describe adsorption characteristics of three substrates.In terms of correlation coefficient,Elovich equation was the best model.

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