

## 含硅熔渣对磷的吸附与解吸特征研究

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### Study on the characteristics of phosphorus adsorption and desorption in slag containing silicon

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**摘要** 采用平衡法研究了含硅熔渣对磷的吸附与解吸特性。结果表明,熔渣对磷的吸附量随着加入液磷浓度的增加而增加,但增加速率逐渐减缓。然而,随着磷吸附量的增加,吸附态磷解吸率逐渐减小,且不同类型熔渣由于化学组成不同吸附与解吸能力也不同。与水溶液相比,尿素、氯化钾和尿素+氯化钾处理能明显降低熔渣对磷的吸附,同时增加吸附态磷解吸率,其中以尿素影响作用更大。熔渣粒径越小,对磷的吸附越强,而对吸附态磷的解吸越弱。Langmuir和Freundlich方程能很好地拟合吸附曲线,其r值都达到了极显著水平;方程参数K、MBC、a、b值都能很好地反映吸附特征。因此,利用含硅熔渣作为硅肥改良土壤或者生产含硅多元复合肥,应考虑熔渣对磷的固定作用及其影响因素。

**关键词:** 熔渣 硅 磷 吸附量 解吸率 熔渣 硅 磷 吸附量 解吸率

**Abstract:** An equilibrium method was used to study the characteristics of P adsorption and desorption in slag containing silicon. The result showed that when P concentration increased, the adsorbing capacity increased, but the increasing rate slowed down gradually. However, with increasing adsorbing capacity of P, the desorption rate of adsorbed P decreased gradually. The adsorption and desorption capability of slag varied greatly due to their differences in chemical components. Adding urea, potassium chloride and their compounds in the slag could reduce the adsorption of P and increase the desorption rate of adsorbed P significantly, and the effect of urea was best. The adsorbing capacity of P increased and the desorption rate of adsorbed P decreased along with minishing particle diameter of slag. The adsorption isotherm of P was well described by using Langmuir and Freundlich equations ( $P < 0.01$ ), whose parameters (K, MBC, a, b) could reflect the adsorption characteristics. Therefore, P fixation in slag and its controlling factors should be taken into consideration when using slag containing silicon as fertilizers to improve soil fertility or producing multivariate compound fertilizers containing silicon.

**Keywords:**

#### 引用本文:

郑杰炳; 王子芳; 高明; 车福才; 魏朝富. 含硅熔渣对磷的吸附与解吸特征研究[J] 植物营养与肥料学报, 2007, V13(3): 504-

ZHENG Jie-bing; WANG Zi-fang; GAO Ming; CHE Fu-cai; WEI Chao-fu. Study on the characteristics of phosphorus adsorption and desorption in slag containing silicon[J] Acta Metallurgica Sinica, 2007, V13(3): 504-

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