

عنوان مقاله:

Solubility and physical composition of rice husk ash silica as a function of calcination temperature and duration

محل انتشار:

مجله بین المللی بازیافت مواد آلی در کشاورزی، دوره 10، شماره 1 (سال: 1400)

تعداد صفحات اصل مقاله: 9

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خلاصه مقاله:

Purpose The solubility of silica is a key parameter affecting its suitability as a rice fertilizer. Therefore, this study determined the effect of calcination temperature and duration on the physical composition of silica derived from rice husk ash. **Method** Rice husks were calcined at 100–900 °C for 15–120 min in an electric furnace. The solubility and physical composition of the samples were measured, and the appearance of the calcined rice husk ash was determined via visual observations. **Results** The appearance of the rice husk ash changed drastically at a calcination temperature of 300 °C. The husk exhibited the whitest color at 500 °C and 120 min of calcination. The solubility of silica in the rice husk ash increased up to a calcination temperature of 500 °C and then started to decrease. The silica in the rice husk ash exhibited a gray zone between the amorphous and crystalline structures. **Conclusion** For actual field applications of silica derived from rice husk ash as a fertilizer, calcination conditions of 400–800 °C and 15 min are proposed to improve solubility. The optimal calcination temperature should be determined based on the heat recovery efficiency.

کلمات کلیدی:

Rice-husk ash, Silica, Fertilizer, Calcination, Recycling, Solubility

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