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直接煮沸和水浴浸提-电感耦合等离子体质谱法测定土壤中有效硼的对比研究

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摘要 以玻璃器皿水直接煮沸 5 m in与塑料杯水浴 (1 0 0℃)加热 65 min两种方法浸提土壤中的有效硼 ,采用电感耦合等离子体质谱法 (ICP-MS)测定。两种浸提方法比较试验结果表明 :与常规的热水浸提法相比 ,塑料杯水浴法具有空白低 ,可以避免样品处理过程中的硼污染 ,条件易于控制 ,成本低的特点。由于水浴法温度低于常规的电热板煮沸法 ,其有效硼测定结果略低于采用煮沸法确定的标准值。两种方法经国家一级标准物质验证 ,测定值均在误差允许范围内 ,其测定值呈显著正相关 (r=0 .988)。方法检出限为 0 .68ng/g(水浴法)、8.2 2 ng/g (煮沸法)。采用该方法测定了某硼矿区土壤样品中的有效硼

关键词 有效硼 电感耦合等离子体质谱(ICP-MS) 土壤 直接浸提 水浴

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Determination of Available Boron in Soil by Derect Seething and Boiling Water Bath Using Inductively Coupled Plasma Mass Spectrometry

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Abstract The available boron from soil were treated by derect seething extraction with glassware for 5min and boiling water bath extraction with Teflon bottle for 65min at the temperature of 100℃. Then the filtrate was determined by inductively coupled plasma mass spectrometry (ICP-MS). Compared with the results from traditional derect seething water method, the results from boiling water bath method showed that the blank level was low, the condition was easy to control, the cost was low, and the determination value for available boron was lower than standard value obtained from derect seething method. The standard substances including GBW07412-GBW07417 were analyzed to demonstrate the accuracy and precision and the obtained values were found to be in a reasonable agreement with the certified values. The results of the two methods were correlative (r= 0.988). The detection limits were 0.68ng/g and 8.22ng/g, respectively. The contents of available boron in soils of boron mineral area were also determined with the two methods.

Key words available boron inductively coupled plasma mass spectrometry(ICP-MS) soil derect seething boiling water bath

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