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半灰化-微波消解-MPT-AES测定大豆皮中的金属元素

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关键词： 微波消解等离子体炬原子发射光谱法 (KeySearch.aspx?type=KeyWord&Sel=微波消解等离子体炬原子发射光谱法)； 大豆种皮 (KeySearch.aspx?type=KeyWord&Sel=大豆种皮)； 金属元素 (KeySearch.aspx?type=KeyWord&Sel=金属元素)

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摘要： 采用半灰化HNO_3-H_2O_2消解大豆皮，微波等离子体矩原子发射光谱(MPT-AES)测定其中铁、镍、镁、钙、锌和铜的含量，同时详细考察了测定各金属元素的最佳试验条件以及介质酸和共存离子的影响。结果表明：测定铁、镍、镁、钙、锌、铜的检出限分别为22.94、7.55、0.36、0.92、16.27、2.1 ng·mL^{-1}，RSD小于3.2%，说明方法精密度较高，线性范围分别为0~12、0~12、0~35、0~32、0~7、0~12 μg·mL^{-1}，加标回收率分别为96.8%~101.3%、98.4%~103.7%、95.9%~99.6%、96.3%~103.5%、99.8%~103.5%、97.6%~105.3%。与常规试验方法相比，MPT-AES法与半灰化和微波消解处理样品相结合具有快速、准确性和重复性高的特点，适用于样品分析。

Abstract: Soybean coat samples were digested by H_2O_2-HNO_3 solution after semi-ashing in a closed microwave system and the determination of iron, nickel, magnesium, calcium zinc and copper in soybean coat has been performed by MPT-AES. Experimental conditions were optimized and established. The effects of acid concentration and coexisting ions(K, Na, Fe, Ni, Al, Zn, M g, Ca)on determination of iron, nickel, magnesium, calcium zinc and copper were investigated. The results showed that the detection limits of iron, nickel, magnesium, calcium, zinc and copper were 22.94, 7.55, 0.36, 0.92, 16.27 and 2.1 ng·mL^{-1}, respectively. The RSD was no more than 3.2%, it showed the adopted method had good precision. The linear ranges of iron, nickel, magnesium, calcium, zinc and copper were 0-12, 0-12, 0-35, 0-32, 0-7 and 0-12 μg·mL^{-1}, respectively. The recoveries were 96.8%-101.3%, 98.4%-103.7%, 95.9%-99.6%, 96.3%-103.5%, 99.8%-103.5% and 97.6%-105.3%, respectively. Compared with conventional test methods, MPT combined with half ash and microwave digestion samples was efficient with high accuracy and repeatability and applicable to sample analysis.

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