Gongke Li et al., J Chromatogr Sep Tech 2016, 7:4(Suppl)
http://dx.doi.org/10.4172/2157-7064.C1.013

Magnetic derived perhydroxy-cucurbit[8]uril nanoparticles for solid-phase extraction to ultrasensitive determination of cytokinins in plant samples by UPLC-MS/MS

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Cytokinins play a critical role in controlling plant growth and development, but it is difficult to be determined in plant samples due to the extremely low concentration level of pmol/g. So it is important of efficient sample preparation with selective enrichment and rapid separation for accurate analysis of cytokinins. Herein, a supramolecular perhydroxy-cucurbit[8] uril (PCB[8]) was fabricated into the Fe_3O_4 magnetic particles via chemical bonding assembly and magnetic perhydroxy-cucurbit[8]uril (MPC) materials were obtained. The MPC had good enrichment capability to cytokinins and the enrichment factors were more than 208. The interaction of MPC and cytokinins was investigated by adsorption test and density functional theory (DFT) calculation. The MPC was used as sorbent of magnetic solid-phase extraction for the analysis of cytokinins in plant samples. A sensitive and selective UPLC-MS/MS method was developed with low detection limits of 0.14-0.32 ng/L for cytokinins analysis. Five cytokinins including zeatin riboside, meta-topolin, kinetin, kinetin riboside and zip with 6.12-87.3 ng/kg were determined in the soybean sprout and arabidopsis thaliana. The recoveries were in the range of 76.2-110% with RSDS of 2.3-9.7%. The magnetic perhydroxy-cucurbit[8]uril materials with selective enrichment capability have good potential for analysis of ultratrace targets from complicate sample matrix.

Biography

Gongke Li obtained her PhD degree in Analytical Chemistry from Sun Yat-sen University of China in 1992. She then joined Sun Yat-sen University and became a Professor since 2000. With expertise in chromatographic analysis and spectral analysis, her major research interests are focused on sample preparation techniques, analytical techniques for trace analysis of complex samples and coupling device for online analysis. She also studies both analytical- and preparative-scale separations methods for natural products. She has published more than 300 research papers in reputed journals, 13 authorized invention patents and 1 monograph. She was awarded the Chinese women's analytical chemist in 2015. She is currently the Associate Editor of *Journal Separation Science*.

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