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www.elsevier.com/locate/talanta

PII: S0039-9140(18)30581-2
DOI: https://doi.org/10.1016/j.talanta.2018.05.088
Reference: TAL18729

To appear in: *Talanta*

Received date: 10 April 2018
Revised date: 15 May 2018
Accepted date: 24 May 2018

Cite this article as: Youxian Li, Beibei Chen, Man He and Bin Hu, Biomethylation metabolism study of arsenite in SCC-7 cells by reversed phase ion pair high performance liquid chromatography-inductively coupled plasma-mass spectrometry, *Talanta,* https://doi.org/10.1016/j.talanta.2018.05.088

Biomethylation metabolism study of arsenite in SCC-7 cells by reversed phase ion pair high performance liquid chromatography-inductively coupled plasma-mass spectrometry

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Abstract

Arsenite (As(III)) has been considered as a human carcinogen associated with many human cancers especially skin cancer. Elucidation of the transformed species of As(III) during its metabolism in cells is beneficial for evaluation of its bioeffect. In this work, a hyphenated method of reversed phase ion pair high performance liquid chromatography - inductively coupled plasma mass spectrometry (RP-IP-HPLC-ICP-MS) equipped with collision/reaction cell technology (CCT) was developed for speciation of As(III) and its metabolites (arsenate [As(V)], monomethylarsonic acid [MMA(V)], and dimethylarsinic acid [DMA(V)]) in SCC-7 cells. The established analytical method exhibits low limits of detection for interest arsenic species in the range of 14-27 ng/L and wide linear range up to four orders of magnitude, providing a sensitive tool for arsenic metabolites analysis and further understanding the metabolism of As(III) in SCC-7 cells. The effect of exposure time, exposure concentrations and elimination time on the arsenic species and total arsenic in