5th International Conference on
Green Chemistry and Technology
&
6th International Conference on
Environmental Chemistry and Engineering
July 24-26, 2017 Rome, Italy

Maja Budanovic, Trends in Green chem, 3:2
DOI: 10.21767/2471-9889-C1-003

Lithium tetrathiafulvalene carboxylate assisted inductively coupled plasma mass spectrometry determination of total mercury in air particulate matter supported by electrochemical study of preservation effects

Maja Budanovic
Nanyang Technology University, Singapore

The multi-elemental analysis of mercury via inductively coupled plasma-mass spectrometry (ICP-MS) in airborne particulate matter ($PM_{2.5}$) is still challenging due to the lack of accuracy for the low level mercury concentrations as a result of mercury instability. Therefore, this study investigated the effect of old and new preservation agents such as gold, methionine and lithium tetrathiafulvalene carboxylate (LiCTTF) to improve the determination of mercury for trace analysis of $PM_{2.5}$ samples. Statistical analysis revealed that a concentration of 10 μg mL^{-1} of LiCTTF was sufficient to obtain highly accurate results with t values of 0.1044 to 1.1239 and apparent recovery of 85% to 100%. An evaluation of the method revealed mercury spiked recovery of 91% and a detection limit of 0.0562 ng mL^{-1}. The method was tested for determination of trace metals in $PM_{2.5}$, demonstrating rather low element concentrations for the stated location. The stated outcomes were examined by conducting electrochemical studies of *in situ* interactions of mercury with LiCTTF and Tetrathiafulvalene (TTF). Cyclic voltammetry and square-wave voltammetry analyses of mercury, and mercury in presence of LiCTTF and TTF revealed complexation between the metal and sulphur-containing compounds.

Biography

Maja Budanovic is a Post-graduate Researcher at Nanyang Technological University in Singapore and has been serving as an SINGA (Singapore International Graduate Award) Ambassador for A*STAR Agency for Science, Technology and Research. She has completed her Master's degree in Analytical and Physical Chemistry and Bachelor's degree in Chemistry from the University of Zagreb.

maja001@e.ntu.edu.sg

Notes: