

Narumol Ramnut 2008: Investigation of Silica Monolith as a Non-Polar Matrix Retainer for Nitrosamines Determination. Master of Science (Chemistry), Major Field: Chemistry, Department of Chemistry. Thesis Advisor: Assistant Professor Orapin Chienthavorn, Ph.D. 120 pages

A novel, simple, rapid and inexpensive sorbent trap for extraction and clean-up of nitrosamines from frankfurters was developed. In a capillary the trap was fabricated to form monolithic polystyrene-co-divinylbenzene (PS-DVB), polydivinylbenzene (poly-DVB) and silica material and they were morphological characterized by a scanning electron microscope (SEM). To be used as an on-line sorbent trap, various factors, such as capability in trapping non-polar matrix and column length of monolithic column were preliminarily studied. Silica monolith provided the best result and it was chosen as the most suitable trap for nitrosamine determination. With a coupling between superheated water extraction (SWE) and on-line silica monolithic sorbent column prior to an analytical column of gas chromatograph (GC), various factors affecting the extraction and determination of nitrosamines, such as sensitivity with and without the monolith, reusability, injection-to-injection precision, column-to-column reproducibility and chromatographic separation, were investigated. Optimal column length of silica monolith was found to be 30.0 mm that offered 27 times reuse. Separation and quantification of selected volatile nitrosamines, namely nitrosodiethylamine (NDEA), nitrosopiperidine (NPIP) nitrosopyrrolidine (NPYR), and nitrosodi-n-propylamine (NDPA), were carried out using GC-FID and GC-MS in a selected ion monitoring (SIM) mode. Using GC-MS the overall extraction and determination method allowed recoveries of *N*-nitrosamines in a range of 75-88% with a relative standard deviation of less than 5%. The detection limit of the coupled method ranged from 2.10 to 5.40 ng nitrosamine injected.

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Thesis Advisor's signature

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