

Khomsan Khaunmeung 2014: Monolithic Solid-Phase Extraction Coupled with HPLC-TOF-MS for Determination of Tetracycline from Waste Water. Master of Science (Chemistry), Major Field: Chemistry, Department of Chemistry. Thesis Advisor: Associate Professor Orapin Chienthavorn, Ph.D. 104 pages.

A C18-silica monolith was fabricated via sol-gel method, and used as an adsorbent in extraction and preconcentration step for determination of tetracycline and its related compounds, namely tetracycline, oxytetracycline and chlortetracycline in waste water. The C18-silica monolithic adsorbent was synthesised via a sol-gel method and developed to solve shrinkage problem in a 5 mL-syringe. The synthesized C18 monolith was compared with commercial C18-packed solid adsorbent in term of extraction performance. Recoveries of tetracycline, oxytetracycline and chlortetracycline spiked in water were 76.46, 72.55 and 81.69% for the C18-silica monolithic SPE, and 92.70, 83.18 and 77.62 for C18-packed silica SPE. Analysis method provided the limit of detection for tetracycline and related compounds in a range of 0.17-0.55 mg/L and linear range between 10-60 ppm with correlation coefficient between 0.98-0.99. For the real waste water, low recoveries of the spiked analytes were obtained when using C18-monolithic SPE, while those for commercial SPE were not obtained because the polar tetracyclines did not well adsorb on the surface of C18 solid phase. For a complicated water matrix with high concentration of analytes, TOF-MS detection was proved to be more beneficial than UV detection because of very low background signal of the chromatogram.

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