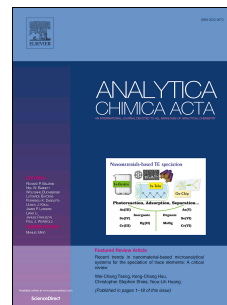


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## An automated magnetic dispersive micro-solid phase extraction in a fluidized reactor for the determination of fluoroquinolones in baby food samples

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### Abstract

An automated magnetic dispersive micro-solid phase extraction procedure in a fluidized reactor was developed for the determination of fluoroquinolone antimicrobial drugs (fleroxacin, norfloxacin and ofloxacin) in meat-based baby food samples. A stepwise injection system was successfully combined with a fluidized reactor and applied for the magnetic dispersive micro-solid phase extraction procedure automation. The developed automated procedure involved injection of the sample solution into the fluidized reactor followed by the on-line separation of the analytes from the sample matrix based on fluidized beds strategy using magnetic nanoparticles, elution and determination of the analytes using a high performance liquid chromatography system with fluorescence detection. The floating of the magnetic nanoparticles in a liquid sample phase was accomplished by air-bubbling. In the developed method Zr-Fe-C magnetic nanoparticles were used as an efficient sorbent for the determination of fleroxacin, norfloxacin and ofloxacin. Under the optimal conditions, the calibration graphs were linear over the concentration ranges of 10 – 1000  $\mu\text{g L}^{-1}$  for fleroxacin ( $R^2=0.996$ ), 5 – 1000  $\mu\text{g L}^{-1}$  for norfloxacin ( $R^2=0.998$ ) and ofloxacin ( $R^2=0.998$ ). The limits of detection, calculated from the blank tests based on  $3\sigma$ , were 3.0  $\mu\text{g L}^{-1}$  for fleroxacin, 1.5  $\mu\text{g L}^{-1}$  for norfloxacin and ofloxacin. The limits of quantification, calculated from the blank tests based on  $10\sigma$ , were 10  $\mu\text{g L}^{-1}$  for fleroxacin, 5  $\mu\text{g L}^{-1}$  for norfloxacin and ofloxacin. The method was applied for the determination of fluoroquinolones in meat-based baby food samples and the results were compared with those obtained by the reference method. The recovery values for all analytes were within of 86-122 % range.

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