

## عنوان مقاله:

Determination of parabens in wastewater and sludge in a municipal wastewater treatment plant using microwaveassisted dispersive liquid-liquid microextraction coupled with gas chromatography-mass spectrometry

## محل انتشار:

مجله مدیریت ومهندسی بهداشت محیط, دوره 6, شماره 3 (سال: 1398)

تعداد صفحات اصل مقاله: 10

## نویسندگان:

Mohammad Mehdi Amin - *Environment Research Center, Research Institute for Primordial Prevention of Non-Communicable Disease, Isfahan University of Medical Sciences, Isfahan, Iran- Department of Environmental Health Engineering, School of Health, Isfahan University of Medical S*

Majid Hashemi - *Environmental Health Engineering Research Center, Kerman University of Medical Sciences, Kerman, Iran-Department of Environmental Health Engineering, School of Public Health, Kerman University of Medical Sciences, Kerman, Iran*

Karim Ebrahimpour - *Environment Research Center, Research Institute for Primordial Prevention of Non-Communicable Disease, Isfahan University of Medical Sciences, Isfahan, Iran- Department of Environmental Health Engineering, School of Health, Isfahan University of Medical S*

Afsane Chavoshani - *Department of Environmental Health Engineering, School of Health, Isfahan University of Medical Sciences, Isfahan, Iran- Student Research Committee, Isfahan University of Medical Sciences, Isfahan, Iran*

## خلاصه مقاله:

Background: Due to the complexities involved in the extraction of micropollutants, the information regarding micropollutants like paraben in wastewater and sludge is scarce. The aim of this study was to adopt a microwave-assisted dispersive liquid-liquid micro-extraction (MADLLME) method for the extraction of parabens in municipal wastewater treatment plant (WWTP). Methods: A mixed stock solution of methyl-, ethyl-, propyl-, and butyl-parabens with concentration of 10 mg/mL were prepared in methanol. To validate this method, the limit of detection (LOD), limit of quantification (LOQ), linearity, and m/z were measured. To adopt this method in different condition, the effect of pH (3, 7, 9, and 12), microwave power (180, 300, 450, and 600 W), solvent type (methanol, acetone, methanol/water, acetone/water), and 1 g folorisil were assessed. After adopting MADLLME method, the paraben fate of this WWTP was evaluated through mass loading and emission. Results: The optimum performance of MADLLME method was observed at pH = 7, microwave power = 450 W, reaction time = 30 s, and methanol as the solvent. The total concentrations of four paraben metabolites in the WWTP ranged between 2505 ng/L in influent, 1953 ng/L in effluent, and 8.03 ng/gat wet weight sludge samples. The total mass loading and emission of four parabens in this WWTP was 0.672 mg/d/1000 people and 0.186 mg/d/1000 people, respectively. Conclusion: MADLLME method seems to be an excellent alternative, as a green extraction technique, for determining various groups of emerging micropollutants in different matrices

## کلمات کلیدی:

Paraben, Environment, Municipal sludge, Dispersive liquid-liquid micro-extraction, Microwave-assisted extraction

