## عنوان مقاله:

In-vitro speciation of molybdenum (II, VI) in human biological samples based on thiol-functionalized mesoporous silica nanoparticles and hexyl-methylimidazolium trispentafluoroethyl- trifluorophosphate


## محل انتشار:

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تعداد صفحات اصل مقاله: 11



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## خلاصه مقاله:

Molybdenum (Mo) ions enter to human body from the diet or drinking waters and have a potentially toxic effect on human. The thiol-functionalized mesoporous silica nanoparticles (HS-MSNPs) was used for determination and speciation of Mo (II, VI) in human biological samples by dispersive ionic liquid-micro-solid phase extraction (DIL-μ-SPE) coupled to electrothermal atomic absorption spectrometry (ET-AAS). Firstly, the mixture of HS-MSNPs (۱۵ mg), the hydrophobic ionic liquid (۱-Hexyl-۳-methylimidazolium tris(pentafluoroethyl) trifluorophosphate; [HMIM][T(PFE)PF۳]) and acetone injected to ۱۰ mL of human blood and serum samples. After shaking for ۵ min, the Mo(II) and Mo(VI) ions were extracted with thiol group of MSNPs at pH ۶ and ۲, respectively and collected through IL in bottom of conical tube by centrifuging. Then, the Mo(II,VI) ions were back-extracted from HS-MSNPs with elent based on changing pH, and remained solutions were determined by ET-AAS after dilution with DW up to ۰.۵ mL, separately. So, the total of Mo(TMo) was simply calculated by the summation of Mo(II) and Mo(VI) content. In optimized conditions, the linear range (LR), the limit of detection and enrichment factor (EF) for Mo(II) and Mo(VI) were obtained (۰.۴۱-۳.۸۲ μg L−۱; ۰.۴۸–۴.۵۵ μg L−۱), (۰.۱ μg L−۱; ۰.۱۲ μg L−۱) and (۱۹.۶; ۱۶.۵) for ۱۰ mL of human blood samples, respectively (Mean of RSD%=۳.۳). At optimized pH, the adsorption capacities of the HS-MSNPs for Mo(II) and Mo(VI) was obtained ۶۸.۷ mg g-۱ and ۵۵.۸ mg g-۱, respectively. In purposed study, a new analytical method for rapid speciation and determination of trace amount of Mo (II, VI) was used in human blood and serum samples. The developed method was successfully validated by ICP-MS analysis.



## کلمات کلیدی:

Molybdenum, Speciation, Human serum, Ionic liquid, Thiol-functionalized bimodal mesoporous silica nanoparticles; Dispersive-ionic liquid-micro-solid phase extraction