

Speciation of inorganic and organic selenium in human serum samples based on isopropyl 2-[(isopropoxycarbothioly) disulfanyl] ethane/ionic liquid by ultrasound-assisted dispersive liquid-liquid microextraction

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A simple *in-vitro* speciation of inorganic selenium (SeIV and SeVI) and organic selenium (Se-Cys, Se-T, Se-Alb Se-M) in human biological samples based on isopropyl 2-[(isopropoxycarbothioly) disulfanyl] ethane thioate (IICDET) as a complexing agent were studied by ultrasound-assisted dispersive liquid-liquid bio-microextraction (USA-DLLMBE). In first stage, 100 μ L (\approx 0.1 g) of hydrophobic ionic liquid of C8MIM [PF6] were only added to organic selenium (Se-Cys, Se-M, and Se-ALB) in 10 mL of standard solution and human serum, urine and plasma samples that were thermally extracted into IL phase at human biological pH in 10 min and after dilution with 100 μ L of acetone, directly determined by electro thermal atomic absorption spectrometry (ET-AAS).

In second stage, after separation IL from sample, inorganic selenium (Se IV) in remained samples was complexed by IICDET and extracted to IL at pH=4 (R-S2Se-R). After reduction Se (VI) to Se (IV) by HCl with temperature 130 °C, inorganic Se speciation was obtained based on total Se determination. After optimized conditions, the enrichment factor (EF), Linear range and limit of detection (LOD) for inorganic selenium were obtained 25.2, 0.02- 1.35 μ g L⁻¹ and 5 ng L⁻¹ in human biological samples respectively. The validation of methodology was achieved by certified reference material (CRM) and ICP-MS.

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