عنوان مقاله:

Evaluation and determination of occupational and environmental exposure of lead in workplace air and human workers based dispersive ionic liquid solid phase micro extraction in battery manufacturing factories from Iran

محل انتشار:

فصلنامه روش های تجزیه در شیمی محیط زیست, دوره 4, شماره 2 (سال: 1400)

تعداد صفحات اصل مقاله: 13

نویسندگان:

Somayeh Mirza - *Ph.D in Environment Chemistry and Management, Department of Environmental Management, Faculty of Natural resources and Environment, Science and Research branch, Islamic Azad University, Tehran, Iran*

Azadeh Yahya Meymandi - *Faculty of Science, Department of chemistry, University of Birjand, Birjand, Iran*

خلاصه مقاله:

The exposure of lead in workplace air and human workers of battery manufacturing factory was evaluated determined by nanotechnology since ۲۰۱۹-۲۰۲۰. Human whole blood (HWB) for subject and healthy peoples (۲۵-۵۵, Men, ۴۰ N) and workplace air (۴۰N) was prepared based on NIOSH sampling. ۱۰ mL of HWB samples added to ۲۰ mg of mixture ionic liquid/ ligand ([HMIM][PF۶]/APDC) modified on graphene oxide nanostructures(GONs) at pH=۶. After sonication, the lead ions separated/extracted by dispersive ionic liquid solid phase micro extraction (DIL-SPME) and determined by flame atomic absorption spectrometry (F-AAS). All air samples in workplace were analyzed based on NIOSH process. The results showed us the negative correlation between Pb concentration in human blood subject and healthy peoples (r=۰.۲۴). The range concentrations of lead in human subject, healthy peoples and workplace air were obtained ۱۹۳.۴- ۵۴۳.۷ µg L-۱, ۸۵.۶-۱۷۵.۹ µgL-۱ and ۴۴.۷-۸۱.۵ µgm-۳, respectively. The LOD, linear rang, enrichment factor(EF) and RSD% were achieved ۱.۲۵ µg L-۱, ۵.۰- ۳۱۰ µg L-۱, ۱۹.۶ and less than ۵% by procedure. The method was validated by standard reference material (SRM), the electrothermal atomic absorption spectrometry (ET-AAS) and ICPMS analyzer for human samples.

کلمات کلیدی:

Lead, Human whole blood, Workplace air, Nanotechnology, Dispersive ionic liquid solid phase micro extraction, Battery manufacturing factories