

عنوان مقاله:

Application of solid phase microextraction and needle trap device with silica composite of carbon nanotubes for determination of perchloroethylene in laboratory and field

محل انتشار:

اولین کنگره ملی نانو فناوری در علوم سلامت (سال: 1397)

تعداد صفحات اصل مقاله: 1

نویسندگان:

Mahmoud Heidari - *Department of Occupational Health, School of Health, Guilan University of Medical Sciences, Rasht, Iran*

Seyed Ghavameddin Attari - *Department of Occupational Hygiene Engineering, Boroujerd Branch, Islamic Azad University, Boroujerd, Lorestan, Iran*

Maryam Rafieiemam - *Department of Occupational Health, School of Health, Guilan University of Medical Sciences, Rasht, Iran*

خلاصه مقاله:

In this paper solid phase microextraction (SPME) and needle trap device (NTD) as two in-progress air monitoring techniques was applied with sililated composite of carbon nanotubes for sampling and analysis of perchloroethylene in air. Application of SPME and NTD with proposed nano-structured sorbent was investigated under different laboratory and experimental parameters and compared to the SPME and NTD with CAR/PDMS. Finally the two samplers contained nano-sorbent used as a field sampler for sampling and analysis of perchloroethylene in dry cleaning. Results revealed that silica composite form of CNTs showed better performance for adsorbent of perchloroethylene. SPME and NTD with proposed sorbent was demonstrated better responses in lower levels of temperature and relative humidity. For 5 days from sampling the relative responses were more than 97% and 94% for NTD and SPME, respectively. LOD were 0.023 and 0.014 ngmL⁻¹ for SPME coated CNTs/SC and CAR/PDMS, and 0.014 and 0.011 ngmL⁻¹ for NTD packed with CNTs/SC and CAR/PDMS, respectively. And for consecutive analysis RSD were 3.9-6.7% in laboratory and 4.43-6.4% in the field. In the field study, NTD was successfully applied for determining of the PCE in dry cleaning. The results show that the NTD packed with nanomaterial is a reliable and .effective approach for the sampling and analysis of volatile compounds in air

کلمات کلیدی:

.Solid phase microextraction; Needle trap device; Carbon nanotube; Sampling; Perchloroethylene

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