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An effective strategy for controlled fabrication and self-assembled modification of template-supported silica nanosheets on a superelastic nickel-titanium alloy fiber for highly efficient solid-phase microextraction

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Highlights:

- The SiO_2NSs coating was successfully fabricated on the NiO/TiO_2NSs template.
- The NiTi@NiO/TiO_2@SiO_2NSs fiber shows good extraction selectivity for PAHs.
- The NiTi@NiO/TiO_2@SiO_2NSs@Ph fiber shows better extraction performance for PAHs.
- The fabricated fiber exhibits enhanced mechanical stability.
- The proposed method is suitable for the determination of PAHs in environmental water.

ABSTRACT

Silica nanosheets (SiO_2NSs) were successfully fabricated on the superelastic nickel-titanium alloy (NiTi) wire as a novel fiber for solid-phase microextraction (SPME). Before sol-gel coating, the NiTi wire was hydrothermally treated in alkaline solution for the in situ growth of NiO/TiO_2 nanosheets (NiO/TiO_2NSs). The sol-gel coating of SiO_2 on the surface of