



Selective recognition of molybdenum(VI) from water by Mo(VI) oxy ion-imprinted particle as an adsorbent

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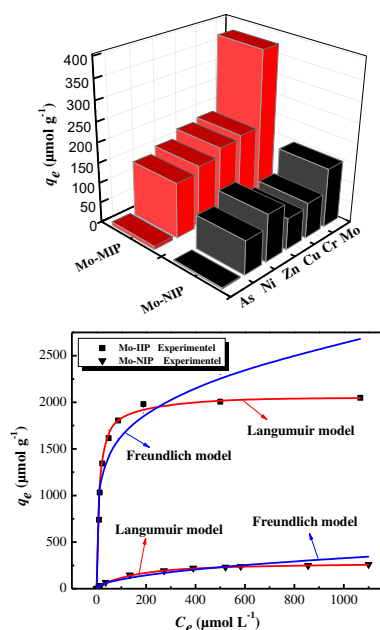
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HIGHLIGHTS

- Mo-IIP by the surface metal ion imprinting technique with a sol–gel process.
- Isonicotinic acid as a functional monomer firstly.
- The saturate binding capacity of Mo-IIP is 2171.46 $\mu\text{mol g}^{-1}$.
- Mo-IIP shows an efficient selectivity towards imprinted Mo(VI) in water phase.

GRAPHICAL ABSTRACT



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ABSTRACT

The isonicotinic acid (4-picolinic acid) served as a functional monomer firstly to prepare Mo(VI) oxy ion-imprinted particle (Mo-IIP) by the surface metal ion imprinting technique with a sol–gel process on the surface of amino-silica, and TEOS acted as a cross-linker monomer. The prepared Mo-IIP was characterized and its proper selectivity recognition ability was investigated by single binding experiments comparing to Mo(VI) oxy ion non-imprinted particle (Mo-NIP). Furthermore, the reuse was carried out. A possible imprinting mechanism was put forward for the Mo-IIP. The binding process fitted well to the pseudo-second-order kinetic model, the Langmuir model, and the Weber–Morris model. The results suggested that a multi-step with the film and intraparticle diffusion process might dominate this chemical sorption for Mo(VI) binding onto Mo-IIP. The Mo-IIP exhibited selectivity for Mo(VI) with a remarkably high binding capacity 2171.46 $\mu\text{mol g}^{-1}$, which was 7.6 times higher than that of the Mo-NIP. Such

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