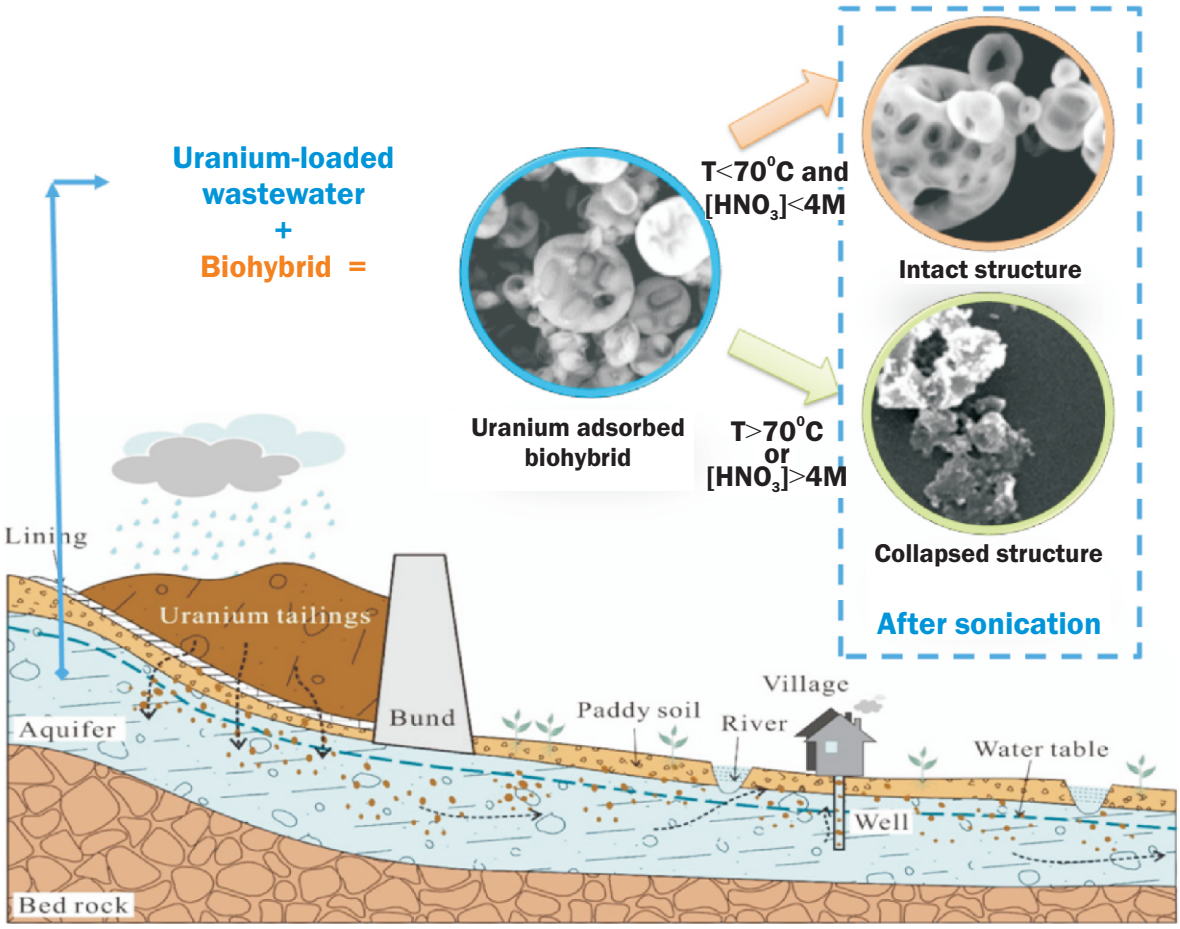
Sonochemical Recovery of Uranium from Nanosilica-based Sorbent and its Biohybrid



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Release of adsorbed uranium from biohybrid adsorbents using ultrasound is established.

Adsorption is widely used as a wastewater remediation technique. Use of nanomaterials to remove uranium by adsorption from nuclear wastewater is widely applied. However, not much work is focused on the recovery of uranium from the sorbents. Our recent article (Lahiri *et al.*, *'Sonochemical recovery of uranium from nanosilica-based sorbent and its biohybrid'*, Ultrasonic Sonochemistry, 2021, **76**, 105667) reports the intensified recovery of adsorbed uranium from the microstructures of silica nanoparticles (SiO_2M) and its functionalized biohybrid (fBHM), synthesized with Streptococcus lactis cells and SiO_2M) using ultrasound. Effects of temperature, concentration of leachant (nitric acid), sonic intensity, operating frequency on the recovery as well as kinetics of recovery were thoroughly studied. A comparison with the silent operation demonstrated five and two fold increase due to the use of ultrasound under optimum conditions in the dissolution from SiO_2M and fBHM respectively. Results of the next cycle of adsorption studies on both the sorbents after sonochemical desorption have also been presented with an aim of reusing the adsorbent back in wastewater treatment.

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