Science, Technology, Research & Innovation for the Environment
STRIVE

SUMMARY OF FINDINGS

STRIVE Report No. 33

The Use of Mesoporous Silicas to Absorb and Separate Metals and Nanoparticles from Aqueous or Organic Solutions

Author: Aoife Burke

Lead organisation: University College Cork

This study investigated the development of new nanostructured materials (silica) for effective treatment of various pollutants including metal ions and metal nanoparticles at laboratory scale. The results demonstrated the ability to remove metals from water can be greatly enhanced by technology (fixed bed of adsorbents) developed in this project. This may provide a basis for future commercial exploitation through sales or licensing.

Key Points

- The conservation and protection of the environment is essential for the health of both human beings and other organisms and therefore, has increased urgency for novel methods of removal of both metal ions and nanoparticles from the environment.

- In this project superior and selective adsorbent silica materials have been developed based on pore size optimisation and chemical modifications of mesoporous materials.

- These resultant materials have been tested for their removal efficiency of heavy metal ions from solutions of various pH and also unbuffered samples.

- In addition to laboratory prepared metal and nanoparticle solutions, an industrial sample supplied by the EPA was also filtered through the fixed bed of adsorbents.

- The results of this study emphasize and support the idea that mesoporous silica materials can be tailored to specific applications.

- The results confirm that mesoporous material synthesised could be successfully applied for waste water treatment in industry.

- This may provide a basis for future commercial exploitation through sales or licensing.

For Further Information

Contact **Aoife Burke** (Department of Chemistry, University College Cork: Aoife.Burke@ucc.ie).

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