15. Title: Materials for removal of heavy metal ions from aqueous waste

Inventor: Prof Josemon Jacob, Department of Materials Science and Engineering

Keywords: Polymeric materials, Heavy metal ion removal

Domain: Environment (Water Purification)

Summary:

Heavy metal ion pollution of aqueous streams is a major environmental concern. The developed polystyrene and acrylamide based polymeric gels are capable of removing commonly found heavy metal ions from aqueous waste. The developed materials are water-swellable, can be regenerated and reused and is capable of removing heavy metal ions commonly found in aqueous waste. More specifically, we have shown that the materials can efficiently remove Cu^{2+}, Cd^{2+}, Mn^{2+}, Zn^{2+}, Pb^{2+}, Ni^{2+}, Co^{2+}, Co^{3+}, Cr^{3+}, Fe^{2+}, Fe^{3+} and Al^{3+} ions from aqueous solution. The polymeric gel can be used as either by packing in a column or by dispersing in the medium followed by centrifugation

Advantages:

» The process is very simple in that the gels can be packed on to a column and aqueous solution containing heavy metal ion contaminants can be passed through to remove them by complexation.

» Most commonly found heavy metal ions as listed above are removed by this process.

Applications: Chemical and manufacturing industries, Pharmaceutical industries, Drinking water

Scale of Development: Adsorption capacity/chelating capacity of the developed gel has been tested

Technology Readiness Level: 4

IP Status: Granted Indian Patent 378482, Indian Patent Application 202211011882