NewTimes – New Trends in Materials Science and Engineering
1st International Virtual Conference
14-18 June 2021

SESSION: *Advanced Materials for water treatment and environmental sustainability*

NOVEL POLYMERIC RESINS FOR THE REMOVAL OF ORGANIC AND INORGANIC CONTAMINANTS FROM WATER

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Newly adsorbent resins based on copolymerization of methacrylate and/or vinyl moieties to eliminate organic or inorganic toxic species from water, were described. Cryo-based and/or traditional chains growth polymerization were employed to achieve materials having peculiar morphologies, and functionalizing them *ad-hoc* to chelate and remove specific molecules. In particular, taking advantages by the hydroxyl pendant groups present on HEMA, our approach involves the use of such resins as active polymeric support to link ZnO by using Atomic Layer Deposition (ALD). This route provides to the materials the ability in photodegrading pollutants *via* UV light after the adsorption process. Whereas, by adding acrylate porphyrin units as comonomer, photodegradation efficiency under *visible light* irradiation can be also accomplished.
Syntheses can be addressed to selectively remove organic contaminants present in trace amount into the water media, by exploiting the imprinting technique. By applying this strategy, pharmaceutical emerging pollutant can be efficiently removed from water in a selective and proficient way.
Concerning exchange resins designed to sequester heavy metals, vinyl cryogels grafted with N-methylglucamine were patented. The technique adopted for the realization of materials allow to obtain different structures as well as shapes of different sizes, with high porosity, permeability and excellent sequestering action towards boron, arsenic, chromium and other metals ions from the water at different pH. The as-prepared materials can be regenerated, reused and easy integrate in the existing water treatment plants.

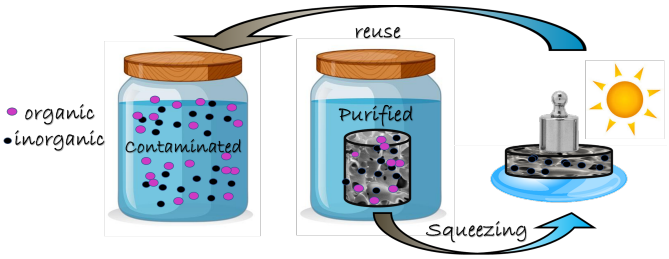

Figure 1. Working action of polymeric resins

References

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