USE OF SAWDUST IN THE REMOVAL OF HEAVY METALS FROM OIL AND GAS PRODUCTION WASTEWATER

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Introduction. During oil and natural gas production, so-called "produced water" comprises the largest byproduct stream. Removal of HMIs from waste water is a prominent issue faced by many countries, especially developing ones. Treated waste water can be re-used in many ways. However, most widely-used methods such as ion exchange and membrane filtration are expensive. This has led to an in-depth research on the potentials of relatively cheaper and eco-friendlier methods than the ones currently in use.

Aim. To analyze the potential of sawdust (a low-cost sorbent) in the adsorption of heavy metals from oil and gas produced wastewater and its advantages over other methods.

Materials and Methods. Materials used in this research include: "Jihyun Lim et al*, Removal of heavy metals from aqueous solution by sawdust adsorption* , 27 Sept 2006"; "John Pichtel, *Oil and Gas Production Wastewater: Soil Contamination and Pollution Prevention* , 14 Feb 2016"; "Stefan Demcak et al, *Utilization of poplar wood sawdust for heavy metal removal from model solutions* , 1 Aug 2017". The methods involved: reading, research, performing adsorption experiments with sawdust using metal ion solutions prepared from salts of heavy metals such as Pb, Cu, Zn.

Results. Sawdust shows approximately 80%-98% efficiency for all model solutions. The amount of HMIs adsorbed increased with the increase in initial concentration and remained nearly constant after equilibrium. The quantity of HMIs removed decreases as pH decreases.

Conclusion. Firstly, sawdust is a promising adsorbent for removal of HMIs from OGPW. At these adsorption levels, a process using sawdust for the removal and recovery of heavy metal ions is potentially more economical than the current technology like ion exchange and membrane filtration. Secondly, adsorption of heavy metal ions depends on their initial concentrations, pH, temperature, and contact time.