

Paying peanuts for clean water

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Peanut husks, one of the biggest food industry waste products, could be used to extract environmentally damaging copper ions from waste water, according to researchers in Turkey. Writing in the Inderscience publication the International Journal of Environment and Pollution, the team describes how this readily available waste material can be used to extract toxic copper ions from waste water. The discovery offers a useful alternative to simple disposal of this ubiquitous food industry waste product.

Copper is an essential trace element found in many living organisms, but at high levels it is potentially harmful and when discharged at high concentration into natural water resources could pose a serious environmental threat to marine ecosystems. Various industries produce waste water containing dissolved copper(II) ions, including those that carry out metal cleaning and plating, paper pulp, paper board mills, and wood pulp production sites and the fertilizer industry.

Conventionally, various relatively sophisticated processes including copper salt precipitation, ion exchange, electrolysis, and adsorption on expensive activated carbon filters are used to remove copper ions from waste water.

Now, Duygu Özsoy and colleagues in the Department of Environmental Engineering, at Mersin University, Turkey, have begun investigating the potential of several materials to absorb the dissolved form of copper from waste water. They have looked at how well untreated peanut husks and another potential cleanup material, pine sawdust, compare in

absorbing copper ions from waste water.

The team measured the levels of copper ions that could be extracted from waste water at different temperatures, acidity, flow rate, and initial concentration of dissolved copper.

They found that, as expected the longer the waste water is exposed to the materials the more efficient the process. However, there is a stark difference between peanut husk extraction and pine sawdust. The peanut husks could remove 95% of the copper ions whereas the pine sawdust only achieved 44% extraction. Efficiency works best if the water is slightly acidic but temperature had little effect on efficiency.

The researchers conclude that both untreated peanut husks, a cheap waste product of the food industry and pine sawdust from the timber industry could be used in waste water cleanup to reduce significantly levels of toxic copper levels.

Source: Inderscience Publishers

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