

# Wastewater cleaned thanks to a new adsorbent material made from fruit peels

March 23 2017

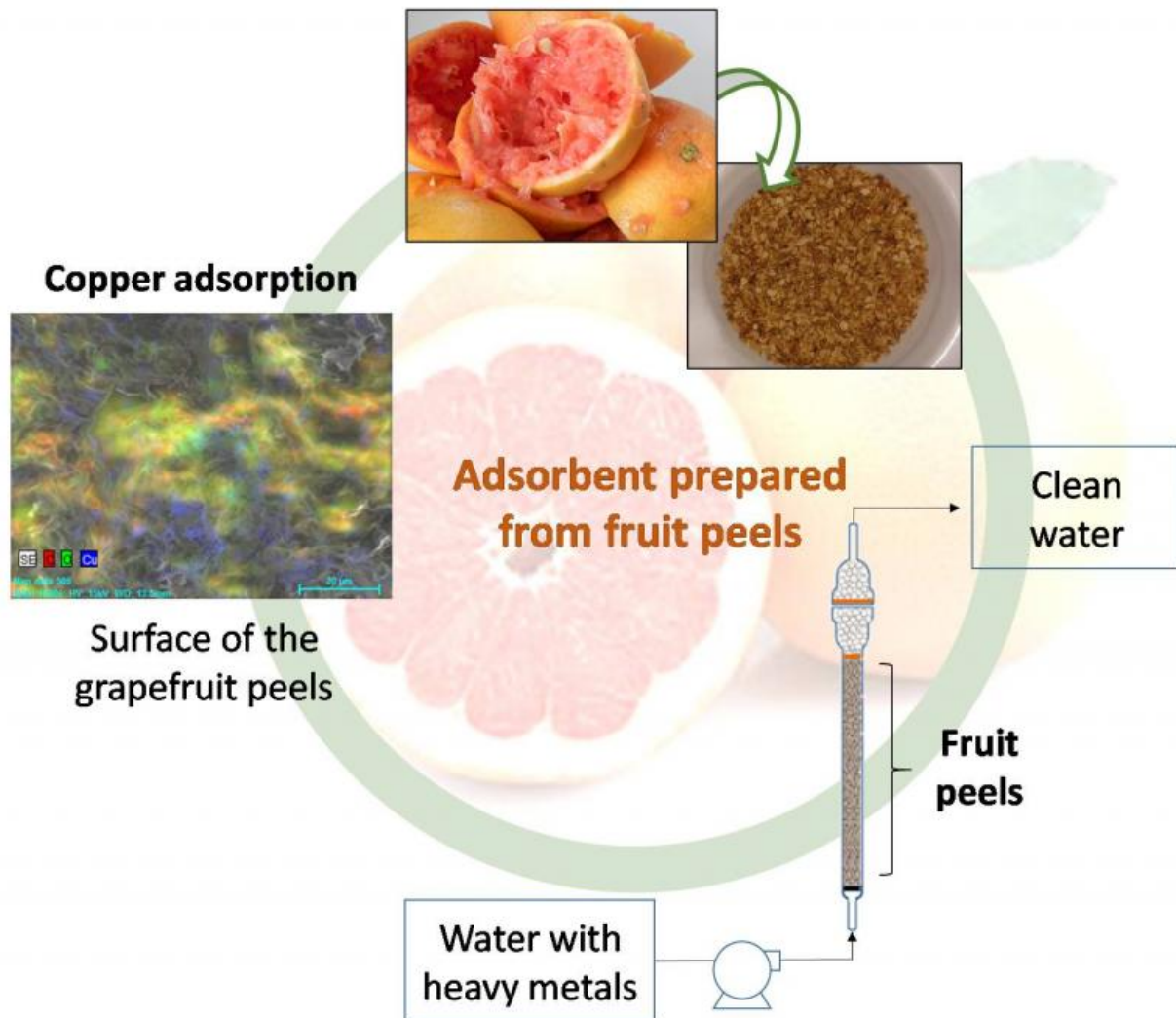


Diagram of the process designed by the UGR researchers. Credit: University of Granada

A collaborative of researchers has developed a process to clean water containing heavy metals and organic pollutants using a new adsorbent material made from the peels of oranges and grapefruits.

The peels are a problem for the food industry, given that they take up a great volume and aren't very useful. An estimated 38.2 million tons of fruit peels are produced worldwide each year in the food [industry](#).

The researchers developed a new process by which it is possible to modify the structure of said residues via instant controlled pressure drop treatment, giving them adsorbent properties such as a greater porosity and surface area.

Researcher Luis Alberto Romero Cano explains that by using a subsequent chemical treatment, they have managed to add functional groups to the material, thus making it selective in order to remove metals and [organic pollutants](#) present in water.

A subsequent study carried out by the authors of this paper has showed that it is possible to pack those new materials in fixed bed columns, in a way similar to standard wastewater treatments. This laboratory-scale study has obtained parameters to design a large-scale use of the materials.

"The results show a great potential for the use of said [materials](#) as adsorbents capable of competing with commercial activated carbon for the adsorption and recovery of metals present in wastewater, in a way that could make it possible to carry out sustainable processes in which products with a great commercial value could be obtained from [food industry](#) residues," Romero Cano says.



Orange peels pose a problem for the food industry, given that they are residues that take up a great volume and which aren't very useful nowadays. Credit: University of Granada

**More information:** Luis A Romero-Cano et al. Grapefruit peels as biosorbent: characterization and use in batch and fixed bed column for Cu(II) uptake from wastewater, *Journal of Chemical Technology & Biotechnology* (2017). [DOI: 10.1002/jctb.5161](https://doi.org/10.1002/jctb.5161)

Luis A. Romero-Cano et al. Biosorbents prepared from orange peels using Instant Controlled Pressure Drop for Cu(II) and phenol removal,

*Industrial Crops and Products* (2016). DOI:  
[10.1016/j.indcrop.2016.02.027](https://doi.org/10.1016/j.indcrop.2016.02.027)

Provided by University of Granada

Citation: Wastewater cleaned thanks to a new adsorbent material made from fruit peels (2017, March 23) retrieved 19 April 2024 from <https://phys.org/news/2017-03-wastewater-adsorbent-material-fruit.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.