Method to fabricate eco-friendly adsorbents for heavy metal ion removal by 3D printing

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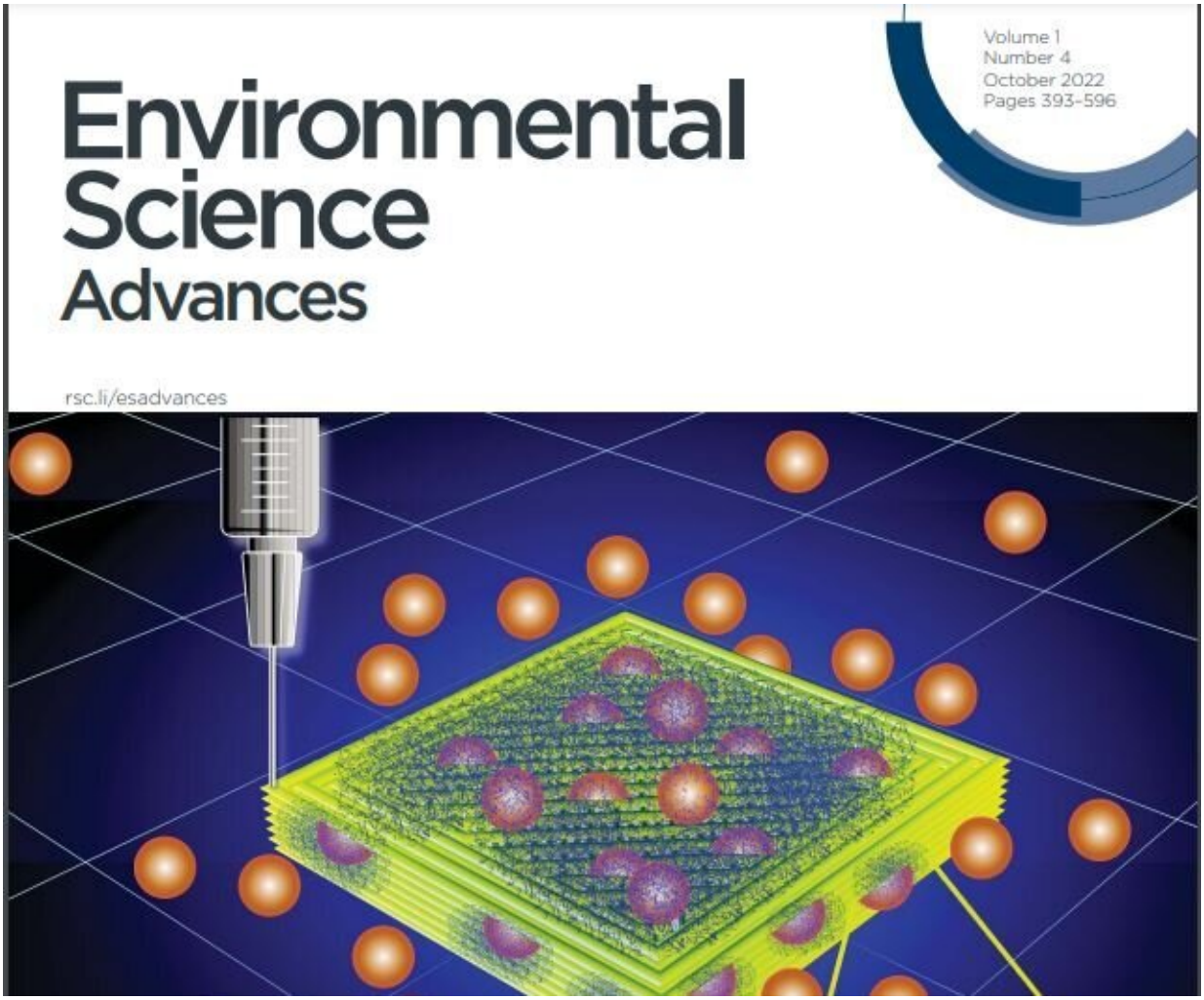

Credit: *Environmental Science: Advances*

One of the leading causes of water pollution is heavy metal contamination which has profound adverse effects on human health and the environment. That's why Clarkson University researchers have developed a cost-effective, 3D printing technology to create sustainable bio-based adsorbents that can effectively remove toxic heavy metal ions from contaminated environments. The 3D printing technique offers a cost-effective, scalable and simple approach to creating tunable adsorbents for environmental remediation that can be used broadly by the community for environmental remediation and sensing applications.

The work performed in the laboratory of Professor Silvana Andreescu, the Egon Matijevic Chair in Chemistry, was recently featured on the front cover page of the journal, *Environmental Science Advances*. Nadia Cheng, a biomolecular science undergraduate, and two chemistry graduate students, Abraham S. Finny and Oluwatossin Popoola, were involved in the project. Nadia started her work on this project as a senior in high school and then as a Clarkson School student.

"Our work demonstrates unique capabilities of green and sustainable materials to be additively manufactured and designed so that they have the ability to capture and remove toxic contaminants, providing innovative solutions for next-generation detection and remediation technologies. This work contributes to the development of materials and methods for environmental monitoring and clean up to achieve the global WHO goals for clean and sustainable water," said Professor Andreescu.

Abraham S. Finny PHD, a Senior Scientist at Waters Corporation and a former member of Prof. Andreescu's lab, says, "Exposure to such innovative, application-focused, and cutting-edge scientific research at Clarkson makes Clarkson graduates excellent problem solvers who go on to become impactful leaders tackling global challenges; another reason why employers find Clarkson graduates highly attractive."

More information: Abraham Samuel Finny et al, 3D printable polyethyleneimine based hydrogel adsorbents for heavy metal ions removal, *Environmental Science: Advances* (2022). DOI: 10.1039/D2VA00064D