

UGM Students Create Heavy Metal Waste Adsorbent from Eggshells

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A group of UGM students has made a breakthrough by inventing a product that can adsorb heavy metal waste.

The adsorbent was developed by utilizing waste of chicken eggshells. The product called Eggshell Adsorbent or Ellbent received grants from Higher Learning Directorate General through the Student Creativity Program for Exact Research 2018.

The product initiators are Muhamad Khairi Mahfudz (Animal Sciences 2017), Frida Prasetyo Utami (Biology 2017), and Sigit Fitriyanto (Mathematics and Natural Sciences 2015). Mentored by Prof. Dr. Ir. Nurliyani, M.S., the three students transformed chicken eggshell waste that has not been widely used into a valuable product.

“Eggshells contain calcium carbonate that can bind heavy metals such as cadmium in batik industry waste,” explained Khairi, Monday (7/16) at UGM.



Khairi said the idea was originated from the concerning heavy metal waste pollution, namely cadmium in batik industries. The majority of batik production uses synthetic dyes which leads to a risk of cadmium pollution that can cause health problems even in small amounts.

Meanwhile, batik industry waste management using adsorbents such as active carbon, zeolite, and synthetic adsorbents costs much money. This makes it rarely used in the wastewater systems of batik industries especially in the final stage.

“In fact, using adsorbent is essential in wastewater management. Therefore, we tried to create an affordable cadmium waste adsorbent from chicken eggshells.”

The product was created by processing eggshells in several steps which include powdering, heating, and activating. The final result obtained powdered chicken eggshells that is packed in tea bags for easy use.

“This study showed a positive result. Adsorbent from eggshell waste holds up to 90.25 percent effectiveness.

The product is expected to solve the issue of cadmium waste pollution in batik industries and also to reduce the cost of wastewater management.

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