Novel functional biochar composites help to treat wastewater

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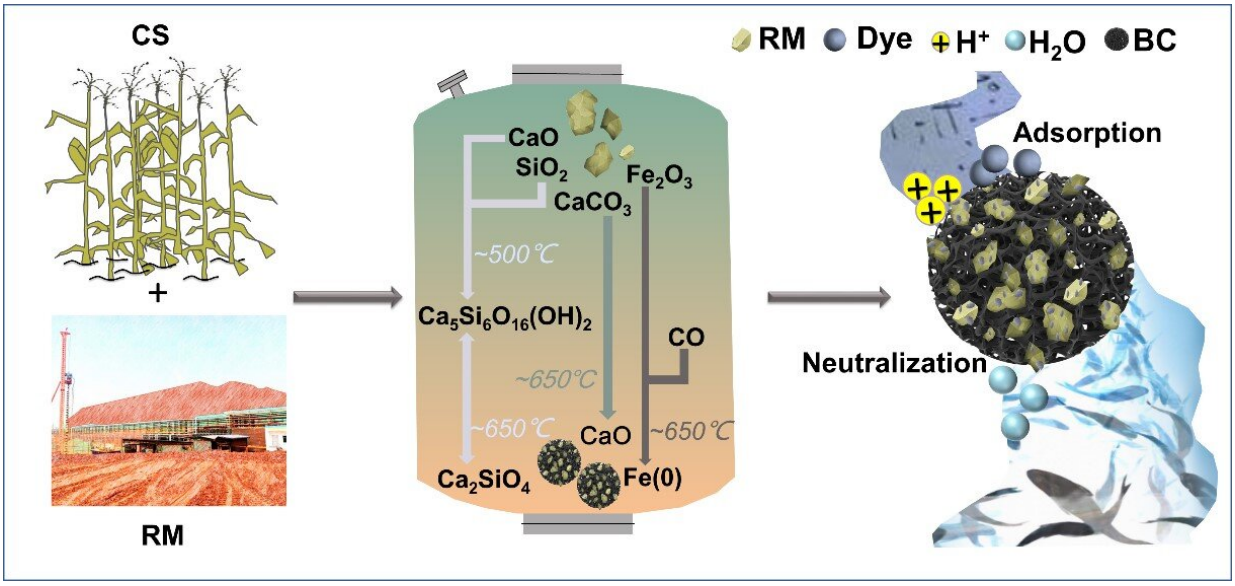

Diagram of the fabrication process and mechanism of FBCs. Credit: GAO Yujie

A team led by Prof. Wu Zhengyan from the Hefei Institutes of Physical Science of the Chinese Academy of Sciences (CAS) recently fabricated novel functional biochar composites (FBCs) using two solid waste-red mud and corn straw, and they exploited them in acidic dye wastewater treatment. Relevant result was published in *Journal of Cleaner Production*.

Red mud is a bauxite residue generated from the Bayer process in the

aluminum industry. More than two billion metric tons of red mud was piled up at random globally, causing waste of land resources and severe environmental pollution. Corn straw is an ordinary agricultural solid waste with more than 200 million metric tons generated annually in China. The exploitation of solid waste is the best way to dispose of it.

In recent years, many methods have been developed to utilize red mud or corn straw, but those methods are not widely promoted and used. Therefore, it is necessary to create a novel method to reuse red mud and corn straw.

In this work, FBCs were fabricated by the co-pyrolysis of red mud and corn straw and exploited in acidic dye wastewater treatment.

According to the researchers, the FBCs showed excellent neutralization performance due to containing alkaline substances (mainly calcium oxide CaO) and adsorption capacity on acidic dyes due to its high surface area. Moreover, FBCs could be collected by magnet because it contains zero-valent iron.

This work provides an efficient approach to reuse waste and a novel technology for acidic dye wastewater treatment.

More information: Yujie Gao et al, Functional biochar fabricated from waste red mud and corn straw in China for acidic dye wastewater treatment, *Journal of Cleaner Production* (2021). DOI: 10.1016/j.jclepro.2021.128887

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