Researchers find a new use for waste
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This new research co-published with Postdoctoral Research Fellow Dr. Chinchu Cherian investigated using untreated PFA as an economically sustainable low-carbon binder for road construction.

"The porous nature of PFA acts like a gateway for the adhesiveness of the other materials in the cement that enables the overall structure to be stronger and more resilient than materials not made with PFA," says Dr. Cherian. "Through our material characterization and toxicology analysis, we found further environmental and societal benefits that producing this new material was more energy efficient and produced low-carbon emissions."

But Dr. Siddiqua notes the construction industry is concerned that toxins used in pulp and paper mills may leach out of the reused material.

"Our findings indicate because the cementation bonds developed through the use of the untreated PFA are so strong, little to no release of chemicals is apparent. Therefore, it can be considered as a safe raw material for environmental applications."

While Dr. Cherian explains that further research is required to establish guidelines for PFA modifications to ensure its consistency, she is confident their research is on the right track.

"Overall, our research affirms the use of recycled wood ash from pulp mills for construction activities such as making sustainable roads and cost-neutral buildings can derive enormous environmental and economic benefits," she says. "And not just benefits for the industry, but to society as a whole by reducing waste going to landfills and reducing our ecological footprints."

In the meantime, while cement producers can start incorporating PFA into their products, Dr. Cherian says they should be continually testing and evaluating the PFA properties to ensure overall quality.

Provided by University of British Columbia

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