

For Immediate Release



AUB study shows promising results for recycling expired pharmaceuticals

Beirut, Lebanon- 07/07/2015 - An AUB research team in collaboration with Cedar Environmental, an environmental and industrial engineering organization, has identified an innovative method for safely recycling expired pharmaceuticals, without resorting to incineration or landfilling.

Led by Dr. Walid Saad, assistant professor of chemical engineering at AUB, the research team tested embedding expired pharmaceutical pills in recycled plastic panel boards developed by Cedar Environmental. The results of their experiments were presented at AUB, on July 7, 2015.

“Disposing of expired pharmaceutical drug pills is a thorny problem the world over,” said Ziad Abi Chaker, president of Cedar Environmental. “In Lebanon, some companies resort to illegal landfilling while others store the expired drugs in warehouses rather than going through the costly process of re-exporting the expired drugs to their manufacturer’s country of origin, as stipulated in current regulations.”

Abi-Chaker added: “Landfilling such drugs is an environmental hazard, since they will seep through our ground water sources, and the extra costs tied to storage ends up finding its way in the prices of drugs to consumers. The bottom line is that people are negatively affected in both cases.”

More recently, there have been a few trials to incinerate these drugs in cement kilns, an exercise which caused a major uproar with residents who live close to the cement factories, he noted.

In 2010, Cedar applied for a patent for a technology it developed which recycles plastic bags and other plastic scraps into thick panel boards used in all kinds of applications to replace wooden or steel panel boards. The technology was dubbed ECOBOARD, which typically weighs between 22 and 25 kilograms and uses up 3700 plastic bags. It is waterproof and rustproof and highly sturdy, lasting hundreds of years.

Since 2012, Cedar and Dr. Saad have been testing the efficacy and safety of embedding expired pharmaceutical pills during the manufacturing process of ecoboards in the plastic matrix. They checked, under various conditions if the active drug ingredients in the pills would leach out from the plastic medium or if they would be sequestered for a long period of time enabling the process to become an acceptable technology to recycle expired pharmaceutical pills without resorting to burning and/or landfilling them.

The Results: Samples containing expired whole pills of the anti-inflammatory drug DYCLOFENAC were subjected to leaching tests in water baths at room temperature (27°C), at 50°C and even at the unrealistic conditions of 70°C. No leaching was detected in any of the 30 samples run containing whole pills. Then the pills were crushed into powder form to force their detection in new samples. Again runs in water baths at room temperature, 50°C, and 70°C were performed and showed extremely low leaching rates.

While the leaching tests were on-going, Cedar developed a manufacturing process to include an aluminum barrier to the pills making their leaching quasi impossible especially that whole pills embedded without any barriers didn't show any leaching.

“We are happy to report that embedding the expired pills within the ecoboards after using the aluminum barrier has proved to be an effective and safe way to dispose of these chemicals,” said Dr. Saad. “These ecoboards with the embedded drugs are safe to use in any application where the boards will not be cut.”

Cedar Environmental hopes to promote the boards embedded with the pills for us as green walls, where plants can be grown. “It would be a two in one, double-win,” said Abi-Chaker.

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Founded in 1866, the American University of Beirut bases its educational philosophy, standards, and practices on the American liberal arts model of higher education. A teaching-centered research university, AUB has more than 700 full-time faculty members and a student body of about 8,000 students. AUB currently offers more than 100 programs leading to the bachelor's, master's, MD, and PhD degrees. It provides medical education and training to students from throughout the region at its Medical Center that includes a full service 420-bed hospital.

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