Bioinspired Carbon Capture Living Structures

Mangrove-inspired concrete captures CO2 twice as fast as traditional mixes while mitigating coastal erosion and acidification.

Researchers at Purdue University have developed a new type of concrete that can be installed in the ocean to quickly sequester CO2, reduce ocean acidification, and imitate mangrove forests. - Inspired by mangrove root structure, this concrete also prevents coastal erosion, provides wave mitigation, and supports the development of coastal ecosystems. Concrete has been known to sequester CO2; CO2 reacts with calcium hydroxide in the concrete to form calcium carbonate. However, this is a slow process, and it may take decades for traditional concrete to reach its full CO2 uptake potential. By adding nanoparticles to concrete, the Purdue researchers tuned the CO2 uptake potential to accelerate capture. With the coastal installation of these concrete mangrove structures, local and global environmental quality will be improved.

Technology Validation: Preliminary data shows that the CO2 capture in a given period for the Purdue researchers' concrete is twice as large as that of traditional concrete.

Advantages

- Higher carbon capture compared to traditional concrete

- Prevents coastal erosion

- Supports the development of coastal ecosystems

Applications

- Coastal installation

TRL: 2

Intellectual Property:

Technology ID

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Category

GreenTech/Carbon Management
Materials Science &
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