

Almond Activated Geopolymer Cement

Tech ID: 34074 / UC Case 2024-598-0

ABSTRACT

Researchers at the University of California, Davis have developed a sustainable alternative to Portland cement by utilizing alkali-activated binders (AAB) with biomass ash, significantly reducing greenhouse gas emissions.

FULL DESCRIPTION

The technology focuses on creating geopolymer concrete using alkali-activated binders (AAB) mixed with biomass ashes, such as almond shell ash, as a climate-friendly alternative to traditional chemical activators. This approach not only aims to reduce the carbon footprint associated with concrete production, but also leverages agricultural waste products, thereby offering a dual benefit of environmental sustainability and resource efficiency.

APPLICATIONS

- ▶ In general, wherever Portland cement is used in projects requiring high strength.
- ▶ Construction materials for infrastructure and buildings.
- ▶ Low-carbon, sustainable urban development projects.
- ▶ Green building certifications and eco-labeling products.
- ▶ Research and development in sustainable construction technologies.

FEATURES/BENEFITS

- ▶ Significant reduction in greenhouse gas emissions compared to traditional Portland cement.
- ▶ Utilization of biomass ash reduces the need for caustic and costly chemical activators.
- ▶ High durability and comparable mechanical properties to Portland cement concrete.
- ▶ Contributes to waste valorization by repurposing biomass residues as construction materials.
- ▶ Potential for cost reduction in concrete production through the use of readily available biomass ash.

PATENT STATUS

Patent Pending

CONTACT

Michael M. Mueller

mmmueller@ucdavis.edu

tel: .



INVENTORS

- ▶ Fan, Jin
- ▶ Harvey, John
- ▶ Markandeya, Ananya
- ▶ Miller, Sabbie
- ▶ Nassiri, Somayeh
- ▶ Yeo, Boon-Ling

OTHER INFORMATION

KEYWORDS

alkali-activated binders,
biomass ash, sustainable
construction, green
building, Portland cement
alternative, low-carbon
concrete, agricultural
waste recycling,
greenhouse gas
reduction, almond shell
ash, eco-friendly
materials

CATEGORIZED AS

- ▶ **Energy**

- ▶ Bioenergy
- ▶ **Environment**
- ▶ Other
- ▶ **Materials & Chemicals**
- ▶ Composites
- ▶ **Engineering**
- ▶ Other

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University of California, Davis
Technology Transfer Office

1 Shields Avenue, Mrak Hall 4th Floor,
Davis,CA 95616

Tel:530.754.8649

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techtransfer@ucdavis.edu

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Fax:530.754.7620