

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

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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
- **RELATED CASES**

2024-598-0

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