

Upcycling of Incinerated Municipal Solid Waste via Spark Plasma Sintering for Sustainable Construction Materials

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Municipal solid waste incineration generates large volumes of residues such as sewage sludge ash, which remain largely underutilised despite their mineral-rich composition. This work explores spark plasma sintering (SPS) as a rapid, energy-efficient method to transform incineration residues into load-bearing construction materials for structural applications. Sludge powders are solidified under optimised conditions up to 1100 °C, yielding cubic specimens measuring 10×10×10 mm with compressive strength up to ±100 MPa, providing a promising potential for construction applications. Microstructural analysis reveals a refined grain structure. At the same time, the process minimises porosity and enables short processing times, highlighting the efficiency of SPS in upcycling waste streams. These findings show a promising potential to transform a municipal solid waste byproduct into a load-bearing construction material via SPS, supporting circular-economy goals and offering a sustainable alternative to conventional construction materials.

Professional Status of the Speaker

Doctoral or Master Student

Interest in submitting a paper in a special issue of

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Invitation letter for visa

No

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