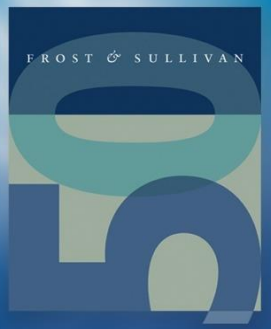
Inside R&D (TechVision)

Research and Development Initiatives in Energy Storage, Biofuels and Tissue Engineering



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FROST & SULLIVAN

Contents

Innovations in Energy Storage, Biofuels and Tissue Engineering

Development of Iron Powder as Alternative Fuel

Problem Statements

Concerns over carbon emissions are driving the development of biofuels or hydrogen fuel for cars.

Biofuels are costly to produce and can displace foodstocks. Hydrogen is also expensive to make and more difficult to store.

Technology Profile

Who: McGill University is developing an iron powder fuel that will be low cost, reduce carbon emissions, and be recyclable for vehicles.

What: The Canadians have developed a prototype burner of iron oxides that stabilizes flame despite suspending a flow of metal particles in the air.

Innovation Attributes

Iron oxides are produced by the millions of tons annually for chemical, electronic, and metallurgical applications

Recycling iron oxides is well understood and enables such fuel to be reduced, further reducing production costs.

The use of iron powder as a fuel is centuries old, dating back to Chinese fireworks, and more recently, NASA solid fuel booster rockets.

The flames achieved by the McGill University prototype burner exhibited nearly the energy density of flames produced by burning hydrocarbon fuels.

What is Iron Oxide Fuel?

When metal powders are burned, they will react with the air and generate nontoxic and stable solid-oxides that can be reused without producing carbon dioxide emissions.

Future Work

The McGill team will design and construct a prototype burner that they will connect to a heat engine. ..

$Funding

Metal combustion research at McGill has been funded by the Canadian and European Space Agencies, among others.

Details: Jeffrey Bergthorson, Associate Professor, Mechanical Engineering, …