

ACTIVATED ALUMINIUM COMPOUNDS FOR HYDROGEN GENERATION

A cost-effective technology for producing hydrogen from aluminium and water under normal operating conditions

Problem / Market Need

Hydrogen is a clean energy carrier with significant potential for transportation, power generation, and fuel cell applications. However, the safe storage, transportation, and on-demand supply of hydrogen remain major challenges. Existing hydrogen generation technologies require complex infrastructure, high energy inputs, or expensive materials, creating a need for simpler and more cost-effective solutions.

Description of Solution / Technology

Researchers at North-West University (NWU) have developed a new technology that enables on-demand hydrogen generation through the reaction of water with specially activated aluminium-based compounds.

The technology delivers high hydrogen yields under normal operating conditions, offering a practical, low-cost solution for clean energy and fuel cell applications.

Key Benefits / Advantages

- On-demand hydrogen generation from water.
- High hydrogen yields under normal operating conditions.
- No external heating or complex infrastructure required.
- Aluminium can also be recycled after the hydrogen production process.
- Lower cost than conventional hydrogen storage methods.
- Suitable for portable and distributed hydrogen supply applications.
- High-purity hydrogen is produced.

Applications / Relevant Industries

- Hydrogen production and supply.
- Fuel cell systems.
- Portable power generation.
- Backup and emergency power systems.
- Remote and off-grid energy applications.
- Defence and military energy systems.
- Renewable energy storage and integration.
- Transportation and mobility sectors.

Stage of Development

The technology has been successfully developed and tested under laboratory conditions.

Intellectual Property Status

Netherlands patent granted - NL2017962B1.

South African patent granted - ZA2017/08276.

Opportunity

NWU is seeking industry partners to further develop and commercialise this innovative hydrogen generation technology. Opportunities exist for licensing, joint development, pilot-scale validation, and integration into hydrogen production, fuel cell, and clean energy applications. Interested organisations are encouraged to contact the Technology Transfer and Innovation Support office at NWU to discuss potential collaboration.



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