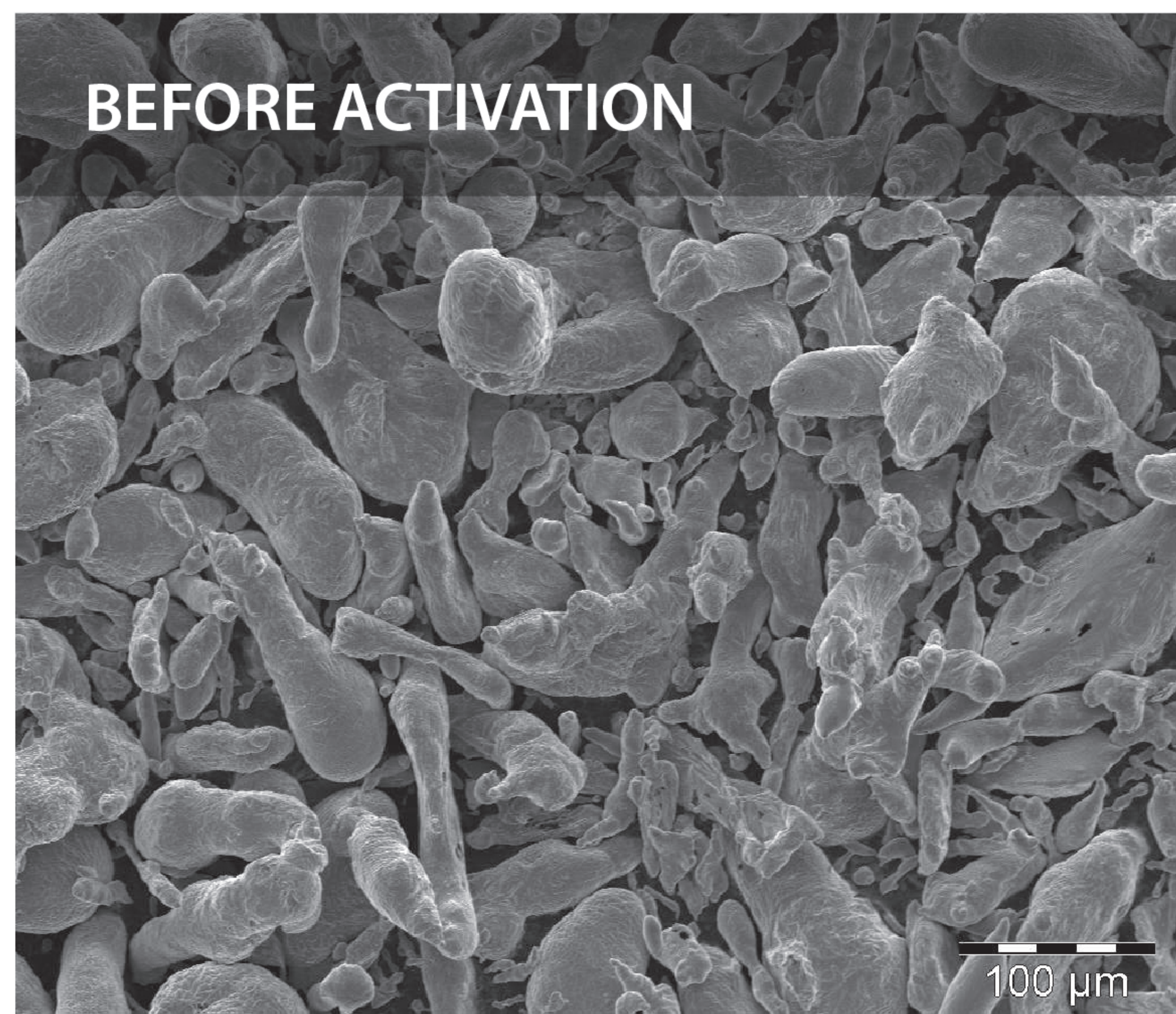


Overview

HySA Infrastructure has developed and patented an activated aluminum composite for on-demand and on-site pure hydrogen generation via the hydrolysis of various qualities of neutral pH water. Aluminum is processed with various activation compounds using high energy ball mills – of which **HySA Infrastructure** holds one of the two specialized mills in Africa. The hydrolysis of one gram of composite yields approximately 1.22 L of pure hydrogen gas. Due to the absence of catalyst poisoning gases (e.g. CO), the obtained hydrogen gas may be directly coupled with a proton exchange membrane fuel cell (PEMFC) to generate an electrical current. These composites may be stored indefinitely if moisture and air exposure is prevented.



Material behavior during activation

- Aluminum and activation compounds are cold-welded during activation;
- Activation compounds are distributed throughout aluminum particles;
- Particles undergo work-hardening as a result of continuous plastic deformation, until breakage occurs;
- Hardened particles do not aggregate;
- Average particle size decreases as hardened particles undergoes further breakage;
- Microgalvanic activity between anodic aluminum and the cathodic activation compounds affords composites with steady hydrolysis activity.

Applications

- Hydrogen obtained from aluminum's hydrolysis may be supplied to various niche PEMFC powered applications:
- <1 kW devices;
- Back-up energy applications, e.g. hospital emergency generators;
- Low infrared heat signature military vehicles;
- in-field hydrogen refueling station;

