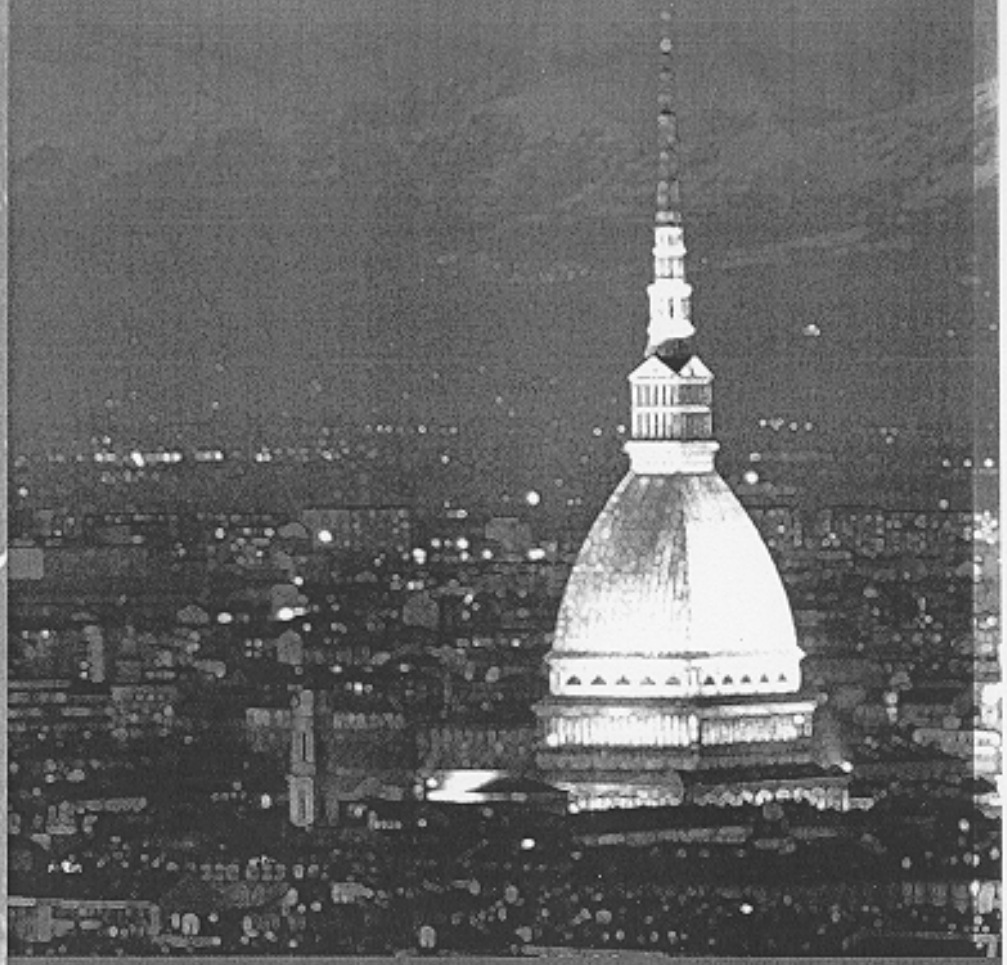
FUEL CELLS 2006

Science & Technology

Scientific Advances in Fuel Cell Systems

13–14 September 2006 • Turin, Italy

DELEGATE MANUAL



A Grove Fuel Cell Event

From the organizers of the Grove Fuel Cell Symposium

ELSEVIER

www.fuelcelladvances.com

P6.2

Commercial devices for hydrogen generation from alkaline borohydride

A. Pozio*[1] , M. De Francesco[1] , C. D'Angelo[2], M. Marrucci[2]
[1]*ENEA, C.R. Casaccia, Via Anguillarese 301, 00060, S. Maria di Galeria (Rome), Italy.* [2]*Errdue srl, Via G.Gozzano 3, 57121, (Livorno), Italy.*
alfonso.pozio@casaccia.enea.it

A new commercial hydrogen-gas generator has been produced that is well suited for supplying hydrogen to several appliances. The hydrogen-gas is generated by the heterogeneous catalytic hydrolysis of aqueous alkaline borohydride solution as it flows into a magnetic-reactor. Aqueous alkaline 30 wt% borohydride solution is safe and promotes long application life, because this solution is non-toxic, non-flammable, and is a high energy-density (≥2200W-h per liter or per kilogram) hydrogen-storage solution. The hydrogen is released from this storage-solution only when it passes over the solid catalyst surface in the reactor, so controlling the flow of the solution over the catalyst controls the rate of hydrogen-gas generation. This allows hydrogen generation to be matched to hydrogen consumption in the appliance, so there is virtually no free hydrogen-gas during power generation. A hydrogen-generator scaled for a system to provide about 300 Nml/min at 4.5 bar for 24 hours is described here.

Keywords: borohydride, hydrogen, fuel cell.