US 20190296409A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2019/0296409 A1**

Goldberg (43) **Pub. Date: Sep. 26, 2019**

(54) **NOVEL ZINC AIR FUEL CELL WITH LONGEVITY**

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(21) Appl. No.: **16/435,479**

(22) Filed: **Jun. 8, 2019**

Publication Classification

(51) **Int. Cl.**

H01M 12/06 (2006.01)

H01M 4/38 (2006.01)

(52) **U.S. Cl.**

CPC ***H01M 12/06*** (2013.01); *H01M 2300/0002* (2013.01); ***H01M 4/38*** (2013.01)

(57) **ABSTRACT**

Performance of a zinc/saline/graphite fuel cell is described with a specific energy of 124 watt hours per kilogram of zinc, but with longevity of greater than 92 days. The chemistry of this fuel cell fundamentally differs from traditional zinc air fuel cells because the species of zinc hydroxychloride anions in solution [$Zn(OH)_3Cl^{2-}$, $Zn(OH)_2Cl_2^{2-}$, $ZnOHCl_3^{2-}$] provide efficient waste management of Zn^{+2} and OH^- ions, and thus the internal resistance of the cell rises slowly. The proposed chemistry of this fuel cell is: $3Zn_{(s)}+3/2O_{2(g)}+3H_2O+6NaCl_{(s)} \rightarrow Zn(OH)_3Cl^{2-}+Zn(OH)_2Cl_2^{2-}+ZnOHCl_3^{2-}+6Na^+$.