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(71) Applicant: NATIONAL UNIVERSITY OF SINGAPORE [SG/SG]; 21 Lower Kent Ridge Road, Singapore 119077 (SG).

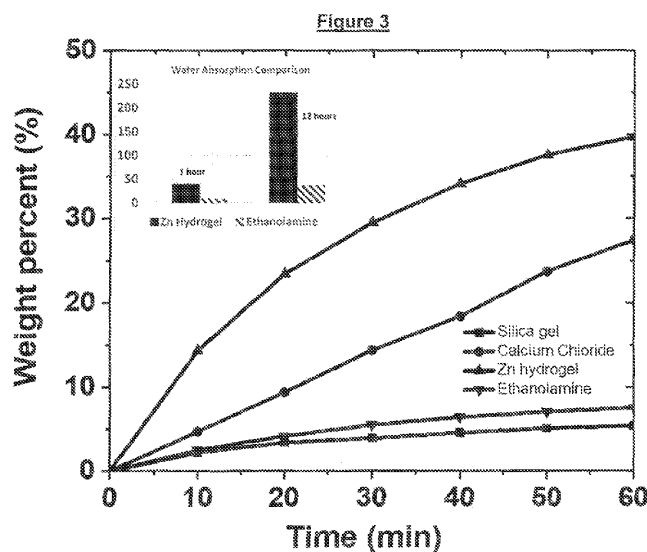
(72) Inventors: NANDAKUMAR, Dilip Krishna; c/o National University of Singapore, Faculty of Engineering, Depart-

ment of Materials Science and Engineering, 21 Lower Kent Ridge Road, Singapore 119077 (SG). RAVI, Sai Kishore; c/o National University of Singapore, Faculty of Engineering, Department of Materials Science and Engineering, 21 Lower Kent Ridge Road, Singapore 119077 (SG). TAN, Swee Ching; c/o National University of Singapore, Faculty of Engineering, Department of Materials Science and Engineering, 21 Lower Kent Ridge Road, Singapore 119077 (SG).

(74) Agent: PATEL, Upasana; Marks & Clerk Singapore LLP, Tanjong Pagar, P O Box 636, Singapore 910816 (SG).

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(54) Title: A HYGROSCOPIC HYDROGEL



(57) Abstract: There is provided a hygroscopic hydrogel that switches between a hydrated state and a dehydrated state upon absorbing and desorbing water, respectively. The hydrogel comprises a non-stoichiometric oxide of a transition metal, X, such as zinc (Zn), copper (Cu), iron (Fe), silver (Ag), wherein the hydrogel in its dehydrated state has a molecular structure with a transition metal to oxygen (X:O) ratio of 1 : 1.1 - 1 : 15. In a specific embodiment, there is also provided a method of forming the hygroscopic hydrogel preferably by annealing an aqueous solution of zinc acetate, ethanolamine and 2-methoxyethanol at a temperature of 30-80 °C for 10-30 minutes.

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