Influence of the electric voltage gradient, electrode spacing and electrode radius on slurry dewatering by vertical electro-osmosis

Liang Wen, Changhong Yan*

School of Earth Sciences and Engineering, Nanjing University, Nanjing 210093, China

*E-mail: yanchh@nju.edu.cn

doi: 10.20964/2020.11.13

Received: 22 June 2020 / Accepted: 17 August 2020 / Published: 30 September 2020

Electro-osmosis technology is an effective method for slurry dewatering, and the voltage gradient, electrode spacing and electrode radius have a large effect on electro-osmosis dewatering. In this paper, a series of tests are conducted to study the effects of those factors on slurry dewatering. The results indicate that a higher voltage gradient can improve electro-osmosis dewatering. Under the same voltage gradient, a smaller electrode spacing leads to a lower discharge rate and less energy consumption, but the water content is also smaller than that with a larger electrode spacing. A larger electrode radius has a good effect on electro-osmosis dewatering, but its energy consumption is also increased. When the slurry is dewatered by electro-osmosis, the water content will be maldistributed after dewatering, with the lowest water content in the anode and the highest in the cathode, and the factors that affect electro-osmosis are also analyzed theoretically. In engineering applications, the voltage gradient and electrode radius should be increased appropriately, and the electrode spacing should be reduced to obtain a lower water content.

Keywords: Electro-osmosis dewatering; Voltage gradient; Electrode spacing; Electrode radius;

[FULL TEXT](#)

© 2020 The Authors. Published by ESG (www.electrochemsci.org). This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution license (<http://creativecommons.org/licenses/by/4.0/>).