Journal of Environmental Health Enginering
Alborz University of Medical Sciences
فصلنامه علمی و پژوهشی مهندسی بهداشت محیط
دانشگاه علوم پزشکی البرز

Volume 7, Issue 2 (2-2020)

jehe 2020, 7(2): 195-210

Back to browse issues page

Evaluation of Rotary Reactor Model Performance to Removal Turbidity from Aqueous Environments by Electrocoagulation Method

Saleh Riahi *, Seyed Ali Ayyoubzadeh, Hossein Samadi-Boroujeni, Gholamreza Moussavi

Ph.D. Student, Department of Water Structures Engineering, Tarbiat Modares Univesity, Tehran, Iran

Abstract: (775 Views)

Background & Objectives: One of the most important problems facing the water treatment plants is seasonal turbidity removal from the drinking surface waters. In this work, the efficiency of turbidity removal from water surface has been studied using a batch rotary reactor model and electrocoagulation process and different electrodes including iron and aluminum were tested. Finally, the optimum values of the studied parameters were evaluated at different operating conditions.

Methods: In order to eliminate the turbidity from drinking water, the discontinuous rotary reactor model with monopolar electrodes was used in parallel connection. The sample volume in the experiments was 377 liters, and the rotation of the model caused all fluid particles, sediments, and contaminants to be homogeneously touched with the electrodes. This model provided a higher efficiency of turbidity removal due to not having pump blades and return pipes.

Results: Results of this study showed that the maximum efficiency of turbidity removal from drinking water would be achieved by using the material of aluminum for electrode and considering time duration of 60 min, rotation speed of the model equal to 1.3 rpm, current density of 18.8 A/m^2 in pH=7.4 and electrode gap distance of 3 cm. At these conditions the maximum turbidity removal efficiency was obtained 84.1 and 93.3% for the iron and aluminum electrodes, respectively.

Conclusion: Results of this work showed that the proposed batch rotary reactor model, in addition to its easy application, is able to remove turbidity from the aqueous solutions at a the high efficiency. Therefore this model would be strongly suggested for application in drinking water treatment plants.

Keywords: Electrocoagulation, Turbidity, Pollution treatment, Batch rotary reactor model

Full-Text [PDF 932 kb] (277 Downloads)

Type of Study: Research | **Subject:** Special

Received: 2020/04/28 | Accepted: 2020/04/28 | Published: 2020/04/28

10.29252/jehe.7.2.195

Security Code

Add Comments

Rights and permissions

Volume 7, Issue 2 (2-2020) Back to browse issues page

jehe.abzums.ac.ir jehe@abzums.ac.ir

Persian site map - English site map - Created in 0.04 seconds with 30 queries by YEKTAWEB 4341