Title
The performance of S2O82−/ Zn2+ oxidation system in landfill leachate treatment

Journal
Physics and Chemistry of the Earth: Volume 120

Document Type
Article

Authors
Abu Amr, S.S.,

Alazaiza, M.Y.D.,

Bashir, M.J.,

Alkarkhi, A.F.M.,

(abbas@unikl.edu.my)

Aziz, S.Q..

Citation
Abu Amr, S. S., Alazaiza, M. Y. D., Bashir, M. J., Alkarkhi, A. F. M., & Aziz, S. Q. (2020). The performance of S2O82−/ Zn2+ oxidation system in landfill leachate treatment. Physics and Chemistry of the Earth, 120(December 2019). https://doi.org/10.1016/j.pce.2020.102944

Abstract

In this paper, the application of combined S2O82−/Zn2+ oxidation was investigated for landfill leachate treatment. Several dosage ratios (g/g) from Sodium persulfate (Na2S2O8 M = 238 g/mol) and Zinc chloride (ZnCl4 207.1920 g/mole) were added to the leachate sample in one oxidation reactor. Results showed that the maximum removal efficiencies for COD (88%) and colour (98%) were obtained using 2 g/12 g S2O82−/Zn+2 dosage, pH (11), and 120 min reaction time, while the maximum removal for NH3–N (60%) was obtained at 180 min of oxidation. In addition, the biodegradability (BOD5/COD) ratio was improved from 0.07 to 0.19. Moreover, the performance of the new oxidation processes (S2O82−/Zn2+) compared to other related treatment processes such as S2O82− oxidation alone, ZnCl4 coagulation, S2O82− oxidation followed by ZnCl4 coagulation and ZnCl4 coagulation followed by S2O82−. The results of S2O82−/Zn2+ oxidation achieved higher removal for COD, colour and ammonia compared to other related processes. The results revealed that S2O82−/Zn2+ oxidation system can be recommended as an efficient process for organic and ammonia removal from leachate