Contribution ID: **603** Type: **Oral Presentation**

Fenton Reaction in Porous Media

Thursday, 2 June 2022 09:55 (15 minutes)

The Fenton reaction is studied and applied for a long-time by global researchers worldwide. However, the investigation of Fenton reaction in porous media to remove pollutants is the least attempted due to the associated complexity. This study attempted applying the Fenton reaction in detoxifying the contaminated-groundwater. The hypothesis behind this study is utilizing the advanced oxidation viz a viz the greatest benefit of the Fenton reaction for the complete and quicker degradation of groundwater organic pollutants. The coarse, meso and nano-sized iron particles were arranged in a column such a way that the generated radicals break the bonds of the complex-structured organic molecules to undergo the degradation. The representative pollutant chosen was phenol due to its wide-application in industries and domestic cleansing agents. Columns with different configurations varying in ZVI distribution and location of H2O2 were investigated for factors influencing sustainable phenol removal. Distribution of mZVI contributed 61-84% more interaction between Fe2+ ions and H2O2, promoted good radical generation and continuous corrosion, invigorated effective Fe2+-Fe3+ cycling, retained active iron surface area and circumvented precipitation and secondary sludge production which extended the active corrosion stage by 5 to 8 times and resulted in 3 to 7 times increment in mg phenol removed/mg mZVI along with 80% to 99.8% utilization of mZVI.

Acceptance of the Terms & Conditions

Click here to agree

MDPI Energies Student Poster Award

Yes, I would like to submit this presentation into the student poster award.

Country

India

References

REFERENCES

Senthilnathan J, Ambika S, 2020. An upgraded electro-Fenton treatment of wastewater using nanoclay-embedded graphene composite prepared via exfoliation of pencil rods by submerged liquid plasma, Journal of Hazardous Materials, 397, 122788, J Haz Mat, IF-10.588 https://doi.org/10.1016/j.jhazmat.2020.122788

Ambika S, Devasena M, Nambi IM, 2020. Single-step removal of Hexavalent chromium and phenol using meso zerovalent iron, Single-step removal of Hexavalent chromium and phenol using meso zerovalent iron, Chemosphere, 248, 125912 IF-7.086 https://doi.org/10.1016/j.chemosphere.2020.125912

Ambika, S., Nambi, I.M., Senthilnathan, J., 2016. Low temperature synthesis of highly stable and reusable CMC-Fe2+(-nZVI) catalyst for the elimination of organic pollutants. Chem. Eng. J. 289, 544-553

Time Block Preference

Time Block A (09:00-12:00 CET)

Participation

In person

Primary author: Dr SELVARAJ, Ambika (Assistant Professor, Department of Civil Engineering; Adjunct Faculty, Department of Climate Change)

Presenter: Dr SELVARAJ, Ambika (Assistant Professor, Department of Civil Engineering; Adjunct Faculty, Department of Climate Change)

Session Classification: MS02

Track Classification: (MS02) Porous Media for a Green World: Water & Agriculture