Review

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PII: S1385-8947(17)31886-7
DOI: https://doi.org/10.1016/j.cej.2017.10.162
Reference: CEJ 17946

To appear in: *Chemical Engineering Journal*

Received Date: 24 August 2017
Revised Date: 26 October 2017
Accepted Date: 27 October 2017

Please cite this article as: C. Liu, B. Wu, X. Chen, Sulfate radical-based oxidation for sludge treatment: A review, *Chemical Engineering Journal* (2017), doi: https://doi.org/10.1016/j.cej.2017.10.162

Sulfate radical-based oxidation for sludge treatment: A review

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Abstract:

An ever-increasing amount of wasted activated sludge is the greatest challenge to wastewater treatment plants on both the economic and environmental sides. Within the last five years, great attention has been attracted to apply sulfate radical ($SO_4^{\bullet-}$)-based oxidation for sludge treatment. Based on the published studies, an extensive review about $SO_4^{\bullet-}$-based oxidation applied for sludge disintegration, dewaterability enhancement, metal solubilization, and micropollutant degradation in the sludge is presented. Focus is placed on sludge dewaterability and disintegration by the activation of peroxymonosulfate (PMS) and peroxydisulfate (PDS) with different activators. Knowledge gaps are pointed out and discussed, more work should be carried out to further supplement and optimize $SO_4^{\bullet-}$-based oxidation processes for highly-efficient and cost-effective treatment in the practical sludge systems though their potentials on sludge treatment have been demonstrated.

Key words:

Sulfate radical; Peroxydisulfate; Peroxymonosulfate; Dewaterability; Disintegration; Advanced oxidation

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