Treatment of Sanitary Landfill Leachate by Advanced Oxidation Techniques

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Abstract : The integrated waste management is an important aspect in the implementation of sustainable development. Leachate generated by sanitary landfills is a high-strength wastewater that is likely to contain large amounts of organic and inorganic matter, with humic substances, as well as ammonia nitrogen, heavy metals, chlorinated organic and inorganic salts. Untreated leachates create a great potential for harm to the environment, they can permeate ground water or mix with surface water and contribute to the pollution of soil, ground water, and surface water. In Algeria, the treatment of landfill leachate is the weakest link in the solid waste management. This study focuses on the evaluation of the pollution load carried by leachate produced in a former sanitary landfill located to the west of Algiers and the implementation of advanced oxidation treatment (advanced oxidation process, AOP), Fenton, electro-Fenton etc. The characterization of these leachates shows that they have a high organic load, mineral and nitrogen. Measured COD reaches very high values of the order of 5000 to 20,000 mg O2 / L. On this non-biodegradable leachate, treatment tests have been carried out by the methods of coagulation-flocculation, Fenton oxidation, electrocoagulation and electro-Fenton. The removal efficiencies of pollution obtained for each of these modes of treatment are respectively 69, 80, 84 and 97%. The study shows that advanced oxidation processes are very suitable for the treatment of poorly biodegradable leachate.

Keywords : advanced oxidation processes, electrocoagulation, electro-Fenton, leachates treatment, sanitary landfill
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