

Decontamination of Wastewater and Leachates by Magnetic Particles.

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The treatment of leachates as pollutant concentrated wastewaters, is still an open issue, and although several different methods are applied for this goal, we are still far way from obtaining low-cost and at the same time efficient processes. Even for wastewater and water, removal of specific contaminants is far from being economical.

Magnetic particles (nano or micron-sized), namely those based on iron oxides, have shown good sorption capabilities, which may be useful for removal/concentration of pollutants/nutrients. Joining this sorption capabilities with their magnetic properties, and with potential functionalization, makes the application of these particles for wastewater or leachate treatment very interesting, specially as we may use magnetic separation methods to further remove, recover and reuse these particles.

In this work we have tested three different kind of magnetic particles, in order to remove/concentrate organic matter (DQO reduction), Nitrogen (Total Nitrogen) and Phosphorous (Total Phosphorous), during several time periods, being successful in removing between 4 and 65 % of them, depending on the controlled parameter, sorption time and type of particle.

We have applied the same particles in three different water streams with different degrees of pollution, so we would be able to analyze the pollutant concentration influence: these being water, wastewater and leachate. In Figure 1 we present as example the case of removal for wastewater resultant from sludge centrifugation, by one of the three different magnetic particle systems we have used.

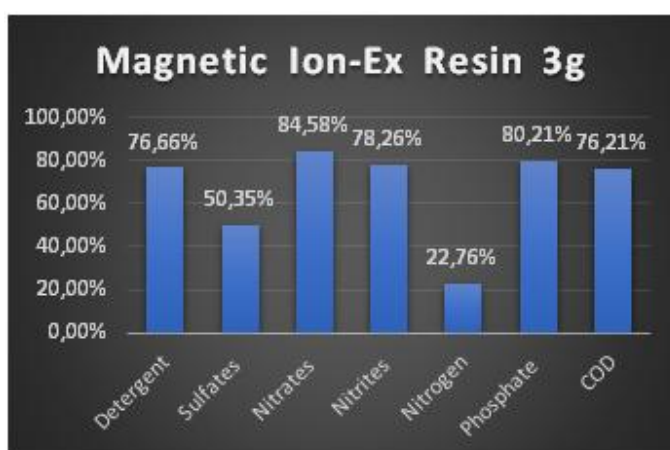


Figure 1 – Treatment results