

Treatment of olive mill wastewater by combined advanced oxidation and biodegradation

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Abstract

In the present study, olive mill wastewater (OMW) treatment is investigated experimentally in various stage processes of advanced oxidation with ozone (O₃), photodegradation by UV radiation, and an aerobic biodegradation. The effects of these treatment processes on the removal of chemical oxygen demand (COD) of OMW are monitored. For both single-stage treatment of O₃ and two-stage treatment of O₃/UV, the chemical oxygen demand remains quite high. In contrast, a combination of biological and UV/O₃ process for the OMW treatment seems to be a serious alternative in the reduction of the COD. In particular, biodegradation of UV/O₃ pretreated OMW found to have the highest removal levels; the percent of COD removal reaches about 91%. On the other hand, the kinetic study shows that the decay of chemical oxygen demand follows a first-order and pseudo first-order models for advanced oxidation and biodegradation processes; respectively.

Keywords COD removal; Biodegradation treatment; Olive mill wastewater (OMW); Kinetic study; Advanced oxidation