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OZONE PRETREATMENT TO IMPROVE THE PHYSICO-CHEMICAL AND BIOLOGICAL PROPERTIES OF LIVESTOCK FECAL WATER

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Abstract

Ozone is a strong oxidant which has a good degradation effect on organic matter and a good disinfection effect. In the present study, the effects of different ozone concentration and treatment time on total nitrogen, total phosphorus, total potassium, organic matter (OM), 5 day biological oxygen demand (BOD_5), chemical oxygen demand (COD_{Cr}) and hygiene indexes in pig manure water under the condition of 5% total solid concentration (TS) were studied. The current research aims at optimizing concentration and time of ozone treatment in pig manure water. Therefore, 5 different ozone concentrations (i.e. 0, 60, 120, 180 and 240 mg/L) are applied to treat fecal water for 10, 20, 30 and 40 minutes. The results showed that the pH, OM content, total phosphorus, total potassium and total nitrogen content of fecal water do not change significantly. On the other hand, with the increasing ozone concentration and treatment time, the contents of BOD_5, COD_{Cr} and suspended solid (SS) in fecal water have a decreasing trend. While the mortality rate of eggs of *Ascaris lumbricoides* were 95%, the number of *E. coli* groups was 10^{-4} as the standards. According to the obtained data, the effect of ozone has enhanced with increasing ozone concentrations. The optimal treatment condition was applying ozone at 240 mg/L for 40 minutes.

Key words: disinfection, *E. coli*, fecal water, ozonation, organic matter

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