

Effect of ultrasonic irradiation on COD and TSS in raw rubber mill effluent.

ABSTRACT

The problem of inadequate clean water is expected to grow worse in the next coming decades. Finding new ways are important to solve this problem. Sonochemical oxidation is one of the advanced oxidation methods in the area of wastewater. Its simple application combined with the production of degradable by-product make the system attractive as an alternative treatment process for difficult- to-treat waste such as rubber effluent. Organic compounds in liquid exposed to acoustic cavitation may act differently according to the physical and chemical properties of the effluent. Batch experiments of sonication were carried out to evaluate the effectiveness of the ultrasonic irradiation of organic compounds in raw rubber mill effluent at different power densities. The degradability of the effluent was assessed based on the changes in the value of COD and TSS values exposed to ultrasonic energy or power density ranging from 0.024W/cm to 0.188W/cm. The highest COD and TSS reduction values were 91% and 76%, respectively was obtained at power density of 0.024W/cm³ after 90 min irradiation. The study shows the optimum conditions for maximum efficacy of the ultrasonic reactors.

Keyword: Rubber wastewater; Ultrasonic irradiation; Organic pollutant; Hydroxyl radical.