

## **Review on biofilm processes for wastewater treatment**

### **Abstract**

This review paper discusses the application of biofilm as an alternative technology for the treatment of wastewater under various loading and operation conditions. In the past few years the biofilm technology has become more common and widely used in the world to meet the requirement for clean water sources of the world's growing population. Besides, the conventional wastewater treatment plants like activated sludge process present some shortcomings such as not very flexible method (if there is sudden change in the character of sewage and the effluent of bad quality is obtained), so better system is urgently needed to provide additional capacity with the least possible cost and to meet the standard effluent by the local authorities. The increased incoming flow of wastewater to the treatment plants and organic loading always demand for additional treatment capacity. Fundamental research into biofilm is presented in this paper in sections that discuss the use of biofilm whereby a comparison between suspended and fixed film, old and new biofilm are made. Besides, bed types namely moving bed, fixed bed and floating bed, un-submerged fixed film systems of trickling filters and rotating biological contactors are explained. Nutrients removal of nitrogen and phosphorus and nano technology application in biofilm are also explained. Results from investigations of different applications carried out at the laboratory and pilot scales are also discussed.

**Keyword:** Biofilm; Wastewater treatment; Trickling filter; Rotating biological contactors; Nutrients removal