

在线超声对流化床膜生物反应器污泥混合液性能影响的研究

Effect of on-line ultrasound on characteristics of activated sludge mixed liquor in a fluidized bed membrane bioreactor

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英文关键词: [fluidized bed membrane bioreactor](#) [on-line ultrasound](#) [membrane fouling](#) [characteristics of sludge mixed liquor](#)

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中文摘要:

在流化床膜生物反应器中引入在线超声辐射来控制膜污染, 超声功率为300 W、频率分别为中频(50 kHz)和中低频(50 kHz和25 kHz)混合频率, 考察了在线超声对反应器内混合液性能的影响及对膜污染的控制效果。结果表明, 中频超声辐射不会对反应器内混合液的污泥浓度和粘度产生显著影响, 而中低频超声辐射会降低混合液的污泥浓度并造成混合液粘度的升高。2种频率的超声辐射对污泥混合液的过滤性能和污泥活性都有一定的改善作用。连续运行26 d和29 d后, 在中频和中低频超声辐射的作用下, 超声流化床膜生物反应器比普通流化床膜生物反应器的跨膜压差分别低8 kPa和14 kPa, 说明2种频率的在线超声均可显著延缓膜污染。

英文摘要:

An intermittent ultrasonic radiation was applied to control the membrane fouling of the fluidized bed membrane bioreactor. The power of ultrasonic radiation was 300 W and the frequencies were mid-frequency of 50 kHz and a mixed-frequency of 50 kHz and 25 kHz, which was called low-mid-frequency, respectively. The impacts of two kinds of ultrasonic radiations on the characteristics of the mixed liquor in MBR reactor and the effect of membrane fouling control during the continuous process were examined in this study. The results showed that mid-frequency ultrasonic radiation had no significant impact on the concentration and viscosity of sludge mixed liquor, while the concentration of MLSS decreased and the viscosity of mixed liquor increased with the low-mid-frequency ultrasonic radiation. The filterability and the activity of sludge mixed liquor were all slightly improved by both frequency ultrasonic radiations. After continuous operation of 26 days and 29 days, the fluidized bed MBR with mid-frequency and low-mid-frequency ultrasonic had a lower transmembrane pressure of 8 kPa and 14 kPa respectively compared to the ordinary fluidized bed MBR. It also interprets that on-line ultrasonic can mitigate the membrane fouling obviously.

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