Membrane bioreactor

combines biodegradation with a separation step to retain sludge (suspended solid) in the system for higher hazardous substances removal.

Membrane bioreactor (MBR) process involves the use of a suspended growth bioreactor for biochemical reactions (such as fermentation, bio-oxidation, nitrification, and denitrification) and a membrane separator for subsequent solids, liquid separation.

Application

The removal rates differ from one compound to the other and depend on the physicochemical characteristics of the hazardous substances. For instance, previous studies have demonstrated MBR ability to remove the hazardous substances such as antibiotics (e.g., azithromycin, clarithromycin, erythromycin, ofloxacin and sulfamethaxazole), analgesics (e.g., carbamazepine, citalopram, ibuprofen, lorazepan, metronidazole, preimidone and trazodone), anti-inflammatory drug (acetaminophen) and stimulant (caffeine) from 75 till 95%.

Economics

The use of membrane bioreactors (MBR) for hazardous substances removal is a technically and economically feasible alternative for wastewater treatment, especially because of high sludge retention time achieved within compact reactor volumes.

Sources:

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