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Extended Abstract
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Industrial Chemistry : 2017- Hybrid water treatment process of alumina ceramic ultra filtration and PP beads with air back flushing: Effect of pH and polypropylene beads - Jin Yong Park

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For advanced water treatment, effects of pH and pure PP beads packing concentration on membrane fouling and treatment efficiency were observed in a hybrid process of alumina ceramic MF and pure PP beads. The tubular UF membrane (NCMT-5231) with pore size 0.05 μm was manufactured by α-alumina in nanopore materials. The diameter of PP beads was 4-6 mm, and the synthetic feed was prepared with humic acid and kaolin. The synthetic feed was allowed to flow inside the MF membrane and the permeated contacted the PP beads fluidized in the gap of the membrane and the acryl module case with outside UV irradiation. Periodic air back-flushing was performed to control membrane fouling during 10 sec (BT, back flushing time) per 10 min (FT, filtration time). These results were compared with the previous studies. The membrane fouling resistance (Rf) was minimum at 50 g/L of PP beads concentration. Finally the maximum total permeate volume (VT) was acquired at 50 g/L of PP beads. It means that the membrane fouling could be controlled by PP beads at 50 g/L. The treatment efficiency of turbidity decreased slightly from 99.4-99.0% as PP beads concentration decrease; however, that of dissolved organic materials (DOM) decreased dramatically from 87.8-73.9% as decreasing PP beads concentration. It means that more PP beads could adsorb or photo-oxidize DOM more effectively. The Rf increased as increasing pH of feed as compared and the maximum VT was acquired at pH 5.1. It means that the membrane fouling could be inhibited at low acid condition. The treatment efficiency of turbidity was almost constant independent of pH; however, that of DOM was the maximum at pH 6.5. It means that the DOM could be removed more excellently at the low alkali condition. Effects of pH and pure polypropylene (PP) beads packing concentration on membrane fouling and treatment efficiency were observed in a hybrid process of alumina ceramic microfiltration (MF; pore size 0.1 μm) and pure PP beads. Instead of natural organic matters and fine inorganic particles in natural water source, a quantity of humic acid (HA) and kaolin was dissolved in distilled water. The synthetic feed flowed inside the MF membrane, and the permeated water contacted the PP beads fluidized in the gap of the membrane and the acryl module case with outside UV irradiation. Periodic air back-flushing was performed to control membrane fouling during 10 s per 10 min. The membrane fouling resistance (Rf) was the maximum at 30 g/L of PP bead concentration. Finally, the maximum total permeated volume (VT) was acquired at 5 g/L of PP beads, because flux maintained higher all through the operation. The treatment efficiency of turbidity was almost constant, independent of PP bead concentration; however, that of dissolved organic materials (DOM) showed the maximal at 50 g/L of PP beads. The Rf increased as increasing feed pH from 5 to 9; however, the maximum VT was acquired at pH 6. It means that the membrane fouling could be inhibited at low acid condition. The treatment efficiency of turbidity increased a little, and that of DOM increased from 73.6 to 75.7% as increasing pH from 5 to 9. water treatment, impacts of pH and unadulterated PP dabs pressing focus on film fouling and treatment proficiency were seen in a cross breed procedure of alumina clay MF and unadulterated PP globules. The rounded UF layer (NCMT-5231) with pore size 0.05 μm was produced by α-alumina in nanopore materials. The measurement of PP dots was 4-6 mm, and the manufactured feed was set up with humic corrosive and kaolin. The engineered feed was permitted to stream inside the MF layer and the penetrated reached the PP globules fluidized in the hole of the film and the acryl module case with outside UV illumination. Intermittent air back-flushing was performed to control film fouling during 10 sec (BT, backflushing time) per 10 min (FT, filtration time). These outcomes were contrasted and the past examinations. The film fouling opposition (Rf) was least at 50 g/L of PP globules fixation. At long last the greatest all out pervade volume (VT) was obtained at

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50 g/L of PP dabs. It implies that the layer fouling could be constrained by PP dots at 50 g/L. The treatment effectiveness of turbidity diminished marginally from 99.4-99.0% as PP dots fixation decline; nonetheless, that of broke down natural materials (DOM) diminished drastically from 87.8-73.9% as diminishing PP dots focus. It implies that more PP globules could adsorb or photograph oxidize DOM all the more adequately. The Rf expanded as expanding pH of feed as thought about and the most extreme VT was procured at pH 5.1. It implies that the film fouling could be hindered at low corrosive condition. The treatment effectiveness of turbidity was practically steady free of pH; in any case, that of DOM was the most extreme at pH 6.5. It implies that the DOM could be expelled all the more incredibly at the low soluble base condition. Impacts of pH and unadulterated polypropylene (PP) dabs pressing focus on film fouling and treatment productivity were seen in a half breed procedure of alumina artistic microfiltration (MF; pore size 0.1 µm) and unadulterated PP globules. Rather than normal natural issues and fine inorganic particles in common water source, an amount of humic corrosive (HA) and kaolin was broken up in refined water. The manufactured feed streamed inside the MF film, and the penetrated water reached the PP dabs fluidized in the hole of the layer and the acryl module case with outside UV illumination. Occasional air back-flushing was performed to control film fouling during 10 s for every 10 min. The layer fouling opposition (Rf) was the most extreme at 30 g/L of PP dot focus. At last, the most extreme all out saturated volume (VT) was procured at 5 g/L of PP dabs, since transition kept up higher all through the activity. The treatment productivity of turbidity was practically consistent, autonomous of PP dot focus; notwithstanding, that of broke up natural materials (DOM) demonstrated the maximal at 50 g/L of PP dots. The Rf expanded as expanding feed pH from 5 to 9; in any case, the most extreme VT was obtained at pH 6. It implies that the layer fouling could be restrained at low corrosive condition. The treatment proficiency of turbidity expanded a bit, and that of DOM expanded from 73.6 to 75.7% as expanding pH from 5 to 9.

Biography Jin Yong Park has his expertise in membrane separation technology for water or wastewater treatment a as a Postdoctoral Fellow at Centre for Polymer Research, University of Texas at Austin, USA

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