Supplementary information (SI)

Internal circulation baffled biofilm reactor (ICBBR)

An internal circulation baffled biofilm reactor (ICBBR), shown schematically in Fig. S1, had a total liquid volume of 860 mL. The ICBBR was divided into top and bottom parts by a segregation board. Thirteen ceramic porous plates were installed in the bottom section of reactor with staggered levels to create serpentine flowing through the lower baffled biofilm section. The solution was driven by a pump to circulate continuously between the upper photolysis part and the lower biodegradation part.

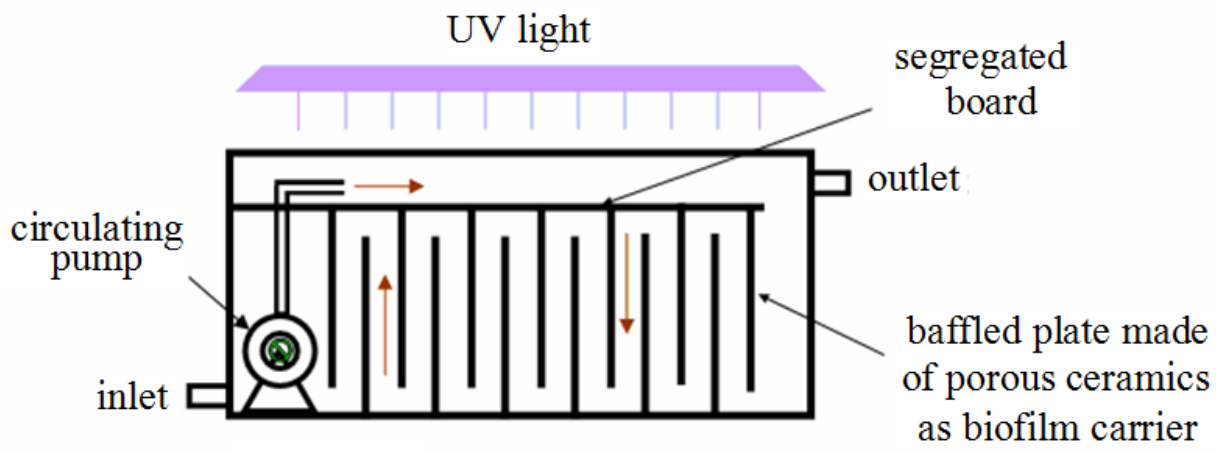

Fig. S1 Sketch of international circulating baffled bioreactor

Direct biodegradation protocol (designated as B)

BTA solution was circulated between top and bottom zones of the ICBBR, after biofilm had formed on the baffle plates, with the UV light turned off. BTA was only biodegraded by biofilm.

Intimately coupled photolysis with biodegradation protocol (designated as P&B)

BTA solution was circulated between top and bottom zones of ICBBR, after biofilm had formed on the baffle plates, with the UV light turned. BTA was simultaneously subject to photolysis and biodegradation.

Biodegradation after photolysis protocol (designated as P*x*min + B)

BTA solution was first photolyzed for *x* minutes. Then, the photolysis solution was introduced to and circulated within the ICBBR with the UV light turned off. BTA was biodegraded in the presence of BTA-photolysis products.