Saturday, June 15th Session 2A (15-2A)
Oral introduction: 15:40-16:50, Poster viewing: 16:50-17:50 Chair: IMAI Tsuyoshi
15-2A-01

Estimation of pharmaceutical removal in a sewage treatment plant
-Model simulation based on laboratory test data-.

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A model was developed to estimate pharmaceutical removal in a sewage treatment plant. The model was based on the material balances of MLSS (mixed liquor suspended solids), pharmaceuticals in liquid and solid phases for the aeration tank and the settler. In the model, non-ideal mixing characteristics for the aeration tank were described using a tanks-in-series model with backflow. The model took into account not only the biological degradation of pharmaceuticals by microorganisms in the activated sludge, but also sorption and desorption of pharmaceuticals onto the microorganisms. The concentration profiles of MLSS, pharmaceuticals in liquid and solid phases in the aeration tank could be predicted by the model using input data, such as kinetic constants for degradation by the activated sludge and adsorption-desorption onto the microorganisms, which could be obtained from laboratory tests. To evaluate the model, model predictions were compared with observed removal efficiencies for Atenolol, Carbamazepine, Diclofenac, Ibuprofen, Sulfamethoxazole and Trimethoprim at sewage treatment plants. The model could reasonably predict trends of removal efficiencies for several pharmaceuticals in a sewage treatment plant.