

PhD Candidate Profile

Name:

Eneliis Kattel

Research Group (if relevant):

Laboratory of Environmental Technology

Research Centre (if relevant):

N/A

Department/School(s) (if relevant):

Department of Materials and Environmental Technology

College:

Tallinn University of Technology

Supervisor(s):

Dr. Niina Dulova and Dr. Marina Trapido

Funding body:

Institutional Research Funding (IUT1-7)

Area (field) of study:

Environmental chemistry and environmental technology, including the application of advanced oxidation technologies for the purification of contaminated water/wastewater

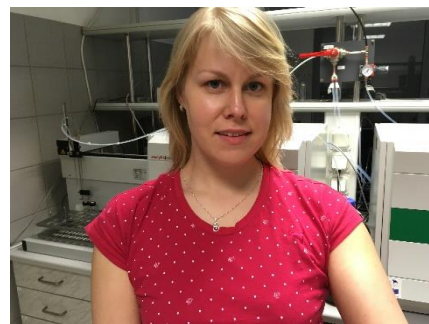
Thesis Title:

Degradation of micropollutants in water and in high strength wastewater by activated hydrogen peroxide and persulfate

Abstract:

Micropollutants are organic compounds that are persistent in the environment and have bioactive properties. They occur in the aquatic compartments mainly in the concentrations of ng/L up to several $\mu\text{g/L}$ and may cause adverse effects on the ecosystem and human health. Usually such compounds enter into the water environment by production, consumption and disposal in various fields. Therefore, it is important to find suitable treatment methods to remove organic micropollutants from water and wastewater. The application of radical-based advanced oxidation technologies (AOTs) has shown promising results in the removal of different organic micropollutants from various water matrices.

Thus, the aim of our research is to compare the efficacies of activated persulfate and hydrogen peroxide processes for the treatment of water matrices with various properties and containing different organic micropollutants.



Collaborations:

N/A

Publications:

Dulova, N.; Kattel, E.; Trapido, M., 2017. Degradation of naproxen by ferrous ion-activated hydrogen peroxide, persulfate and combined hydrogen peroxide/persulfate processes: the effect of citric acid addition. *Chemical Engineering Journal*, 318, 254–263.

Kattel, E.; Dulova, N., 2017. Ferrous ion-activated persulphate process for landfill leachate treatment: removal of organic load, phenolic micropollutants and nitrogen. *Environmental Technology*, 38 (10), 1223–1231.

Kattel, E.; Trapido, M.; Dulova, N., 2017. Oxidative degradation of emerging micropollutant acesulfame in aqueous matrices by UVA-induced $\text{H}_2\text{O}_2/\text{Fe}^{2+}$ and $\text{S}_2\text{O}_8^{2-}/\text{Fe}^{2+}$ processes. *Chemosphere*, 171, 528–536.

Kattel, E.; Dulova, N.; Viisimaa, M.; Tenno, T.; Trapido, M., 2016. Treatment of high-strength wastewater by Fe^{2+} -activated persulfate and hydrogen peroxide. *Environmental Technology*, 37 (3), 352–359.

Trapido, M.; Tenno, T.; Goi, A.; Dulova, N.; Kattel, E.; Klauson, D.; Klein, K.; Tenno, T.; Viisimaa, M., 2017. Bio-recalcitrant pollutants removal from wastewater with combination of the Fenton treatment and biological oxidation. *Journal of Water Process Engineering*, 16, 277–282.

Klein, K.; Kattel, E.; Goi, A.; Kivi, A.; Dulova, N.; Saluste, A.; Zekker, I.; Trapido, M.; Tenno, T., 2017. Combined treatment of pyrogenic wastewater from oil shale retorting. *Oil Shale*, 82–96.

Kattel, E.; Kivi, A.; Klein, K.; Tenno, T.; Dulova, N.; Trapido, M., 2016. Hazardous waste landfill leachate treatment by combined chemical and biological techniques. *Desalination and Water Treatment*, 57 (28), 13236–13245.

Kattel, E.; Trapido, M.; Dulova, N., 2016. Treatment of landfill leachate by continuously reused ferric oxyhydroxide sludge-activated hydrogen peroxide. *Chemical Engineering Journal*, 304, 646–654.

Klauson, D.; Klein, K.; Kivi, A.; Kattel, E.; Viisimaa, M.; Dulova, N.; Velling, S.; Trapido, M.; Tenno, T., 2015. Combined methods for the treatment of a typical hardwood soaking basin wastewater from plywood industry. *International Journal of Environmental Science and Technology*, 12 (11), 3575–3586.

Klauson, D.; Kivi, A.; Kattel, E.; Klein, K.; Viisimaa, M.; Bolobajev, J.; Velling, S.; Goi, A.; Tenno, T.; Trapido, M., 2015. Combined processes for wastewater purification: treatment of a

PhD Candidate Profile

typical landfill leachate with a combination of chemical and biological oxidation processes. *Journal of Chemical Technology and Biotechnology*, 90, 1927–1536.

Bolobajev, J.; Kattel, E.; Viisimaa, M.; Goi, A.; Trapido, M.; Tenno, T.; Dulova, N., 2014. Reuse of ferric sludge as an iron source for the Fenton-based process in wastewater treatment. *Chemical Engineering Journal*, 255, 8–13.

Presentations:

1st International Conference on Sustainable Water Processing (SWPG16). Sitges, Spain, 11-14 September 2016.

The 15th European Meeting on Environmental Chemistry (EMEC15). Brno, Czech Republic, 3-6 December 2014.