



P7 - Environment and nutrient recycling

Stina Jansson, Dept.of Chemistry, UmU

stina.jansson@umu.se

www.chemistry.umu.se

Current work in the platform

PIs in the platform:

- Stina Jansson, UmU, Dept. of Chemistry
- Christoffer Boman, Dan Boström, Nils Skoglund, UmU, Dept. of Applied Physics and Electronics
- Torgny Näsholm, SLU, Dept. of Forest Ecology and Management
- Johan Ingri, LTU, Dept. of Civil, Environmental and Natural Resources Engineering





Strategic means projects

Free means:

- Recirculation of wood ash in boreal catchments, role of Fe-organic carbon aggregates and processes along the soil solution flow paths / Ingri, Boström, Näsholm, Jansson
- Valorization of pulp and paper mill ashes and sludge by a two-step treatment approach – A feasibility study / Boman, Borén, Latham

Targeted means:

- Recirculation of wood ash / Ingri, Boström, Näsholm
- Flow and transformation of contaminants / Jansson, Boman
- Valorisation of biomass ashes – mapping the potential for different forestry based processes / Boman, Skoglund, Näsholm
- Fermentative production of arginine from organosolv hydrolysates for generation of arginine phosphate fertilizers / Skoglund, Näsholm

Current work and highlights (1)

New findings and research outcomes

- New extraction method developed for assessing the regenerative properties of carbonaceous sorbents (EnvironSciPollutRes 2020, in press)
- Addition of wood ash catalyzes biochar formation and increases biochar yield and fixed carbon content, i.e. increasing conversion efficiency and carbon sequestration potential significantly. (JCleanProd (2019) 208:960-7, ACS SustainChemEng (2019) 7:4204-9)
- Improved understanding of trace metal cycling in the boreal landscape, and development of a tool to study topographic influences on water quality (i.e. the Ce-anomaly). Particularly important in the context of climate change, and in the research front internationally. (Paper in prep in the Ingri group)
- Rebbling A, ..., Skoglund N. Demonstrating fuel design to reduce particulate emissions and control slagging in industrial-scale grate combustion of woody biomass. (Energy and Fuels 2020;34:2574-2583.)

Current work and highlights (2)

New projects and collaborations

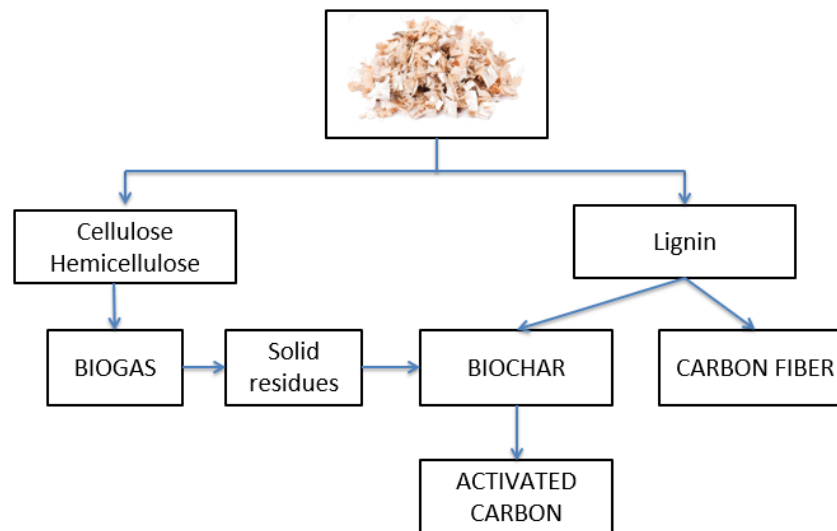
- “SafeSed - Safe and non-destructive removal of contaminants from sediments” – UmU, SGU, Sweco, Mora municipality, ENRES, ecoSPEARS. (S.Jansson)
- “Strengthening capacity for sustainable bioenergy, waste management and air pollution control in Rwanda” SIDA-UR – UmU (TFE and Chemistry), SLU (Umeå and Uppsala), KTH and University of Rwanda. (C.Boman)


Current work and highlights (3)

Recent/Completed studies

INFORMAT - Integrated conversion of forest residues into methane and carbonized biobased materials, 2016-2019 (S.Jansson). Collaboration between UmU, LTU, Podcomp, Sveaskog, BOBIC, and Miljötekniskt Center MTC.

INFORMAT





Planned research for the next programme period

- Build onto the research successfully conducted in the platform, and take additional steps in addressing issues related to sustainability, environmental protection, climate change mitigation, health, resource utilization, etc, by including topics that were previously not covered.
- Cross-disciplinary collaborative research with focus on environmental assessment of biorefinery processes.
- Improved understanding of feedstock composition, processing conditions, and the formation, transformation and degradation of pollutants of concern for health and environment.
- System overview perspective for identifying synergies, improvement potential, efficient resource utilization, and how residues and nutrients can be recovered and reused - adding steps to value chains.