



VTT

GreenAro: Production of bio-based BTX aromatics

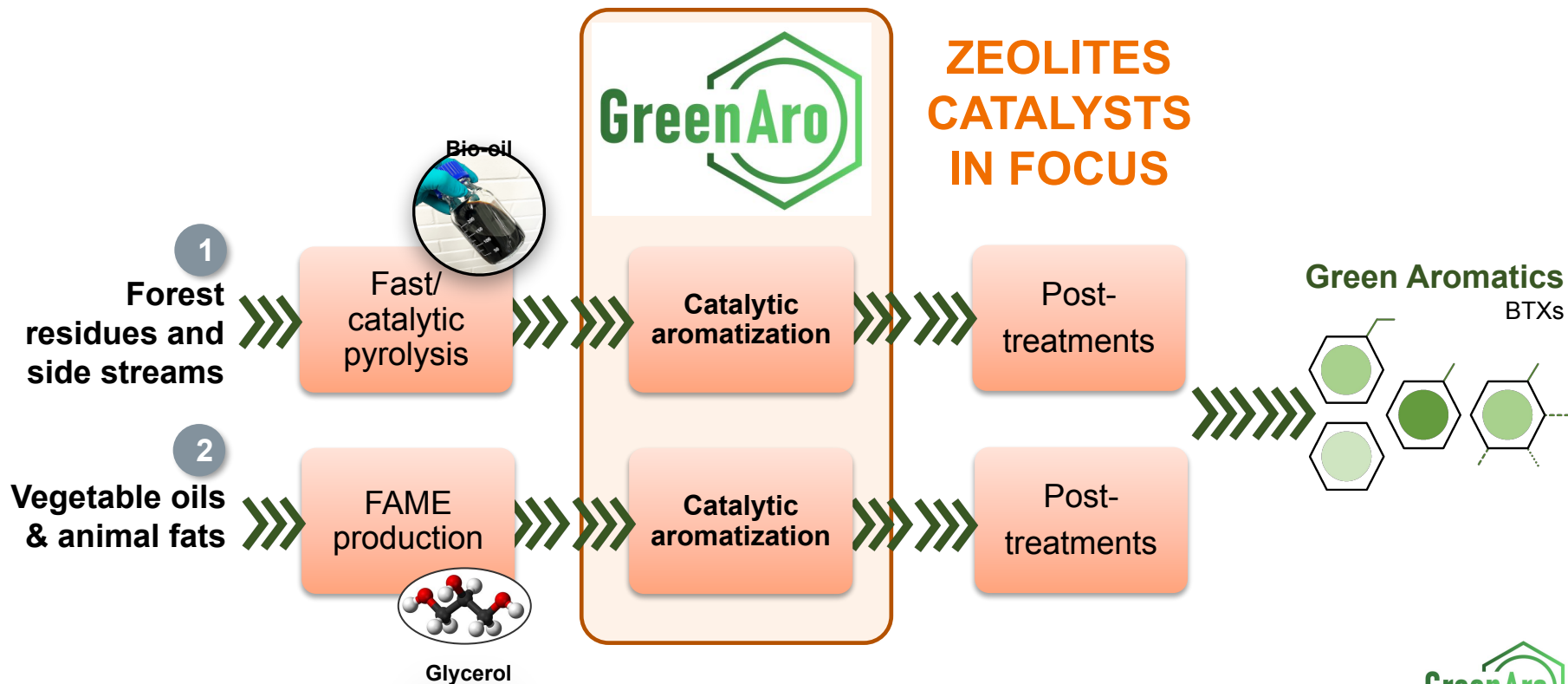
Neste Veturi final event

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Veikka Lehtinen



06/06/2024 VTT – beyond the obvious

From sustainable raw materials to aromatics



Academic/Research partners

VTT

Call and project coordination

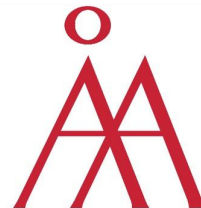
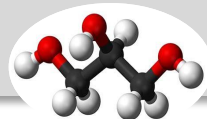
Catalyst development and testing of bio-oil route to aromatics
Concept modelling & TEA



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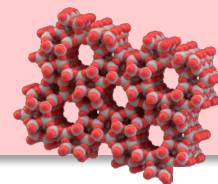
Aalto University

Catalyst development and testing of glycerol route to aromatics



Åbo Akademi

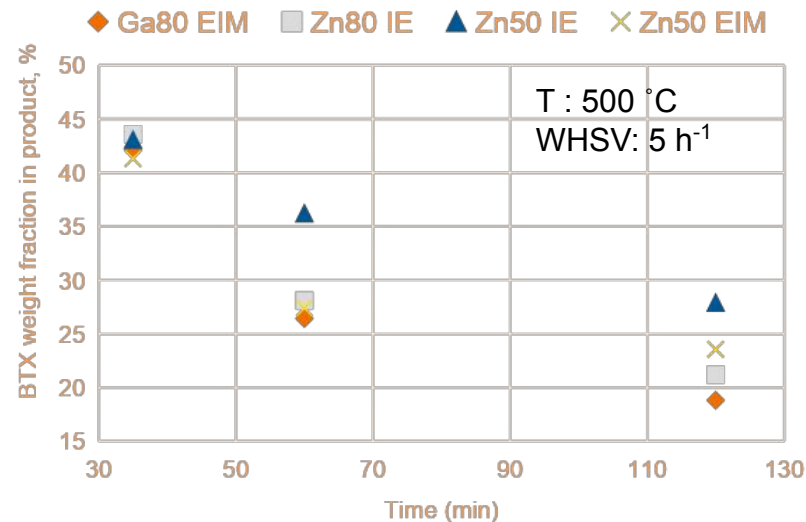
Catalyst preparation and characterization
Fingerprint reaction: aromatization of furfural with ethanol



Bio-oil aromatization – Catalysts and results

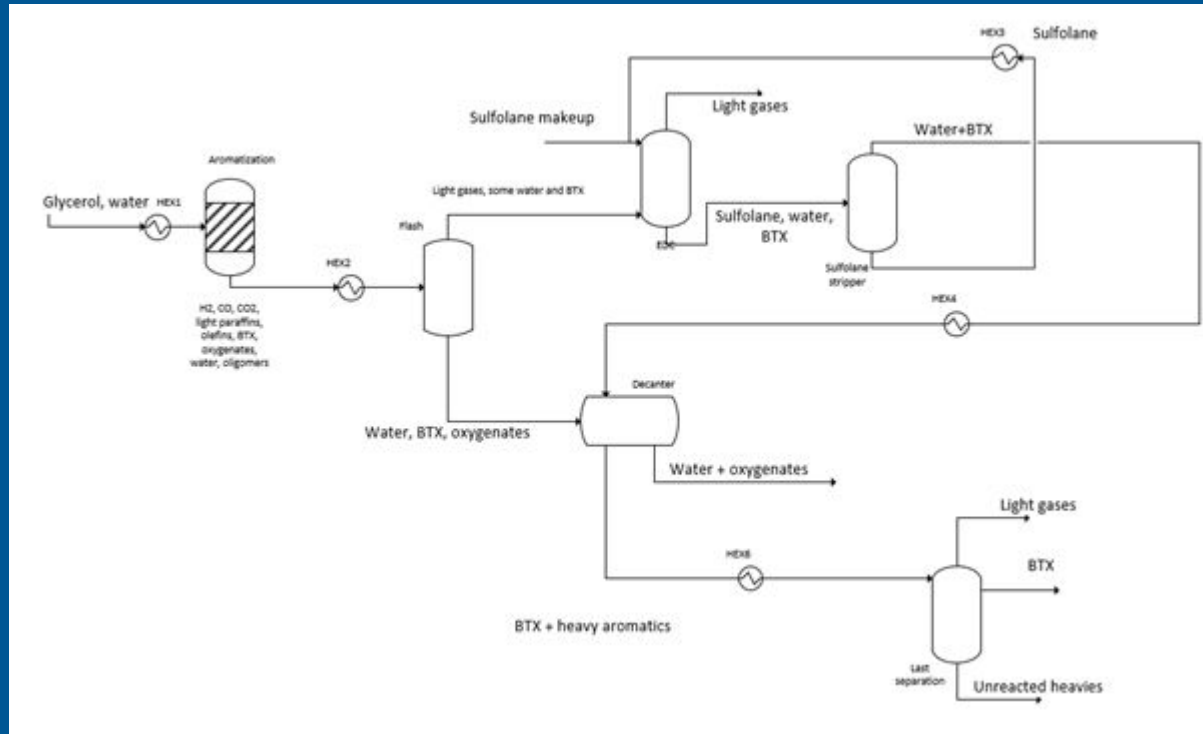
Catalyst	Abbreviation	Preparation method
H-ZSM-5 (50)	-	Ion exchange
2 w-% Zn-ZSM-5 (30)	Zn30 IE	Ion exchange
2 w-% Zn-ZSM-5 (50)	Zn50 IE	Ion exchange
2 w-% Zn-ZSM-5 (50)	Zn50 EIM	Evaporation impreg.
2 w-% Zn-ZSM-5 (80)	Zn80 IE	Ion exchange
3 w-% Ga-ZSM-5 (80)	Ga80 EIM	Evaporation impreg
3 w-% Ga-ZSM-5 (80)	Ga80 IW	Incipient wetness impreg.

Fe - and Fe/Zn-ZSM-5 (50) planned for future experiments



- Initial BTX yield quite similar with all tested catalysts
- Ion exchanged moderate acidity (Si/Al 50) zinc catalyst most stable with time
- Gas production similar with all catalyst being 13 – 17 %. Propene > ethene > propane. Followed by ethane and butanes
- Loss of activity caused by coke deposition on catalyst

Concept studies – Glycerol aromatization



bey⁰nd

the obvious



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