



Methane production from process water of the hydrothermal carbonization of food waste and sewage sludge

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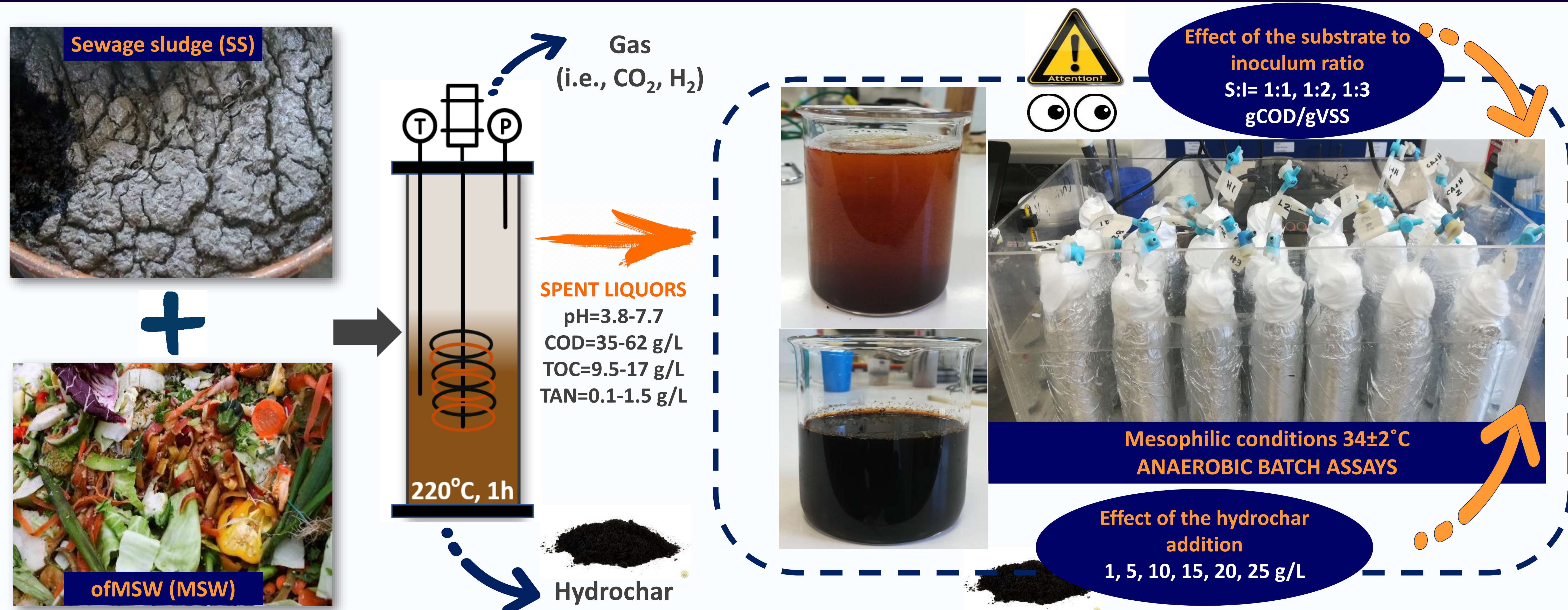
INTRODUCTION

- Hydrothermal carbonization (HTC) has gained interest as an attractive waste management strategy to harness energy from wet and low-value biomass.
- Depending on the HTC operational conditions and the raw biomass composition, high amount of organic and complex refractory compounds can be found in the liquid phase resulting in high chemical oxygen demand and total organic carbon.
- Since the liquid phase contains several minerals and dissolves organics, it can be an interesting substrate for anaerobic digestion to reduce the organic matter content and to produce an extra energy by means of biogas production.

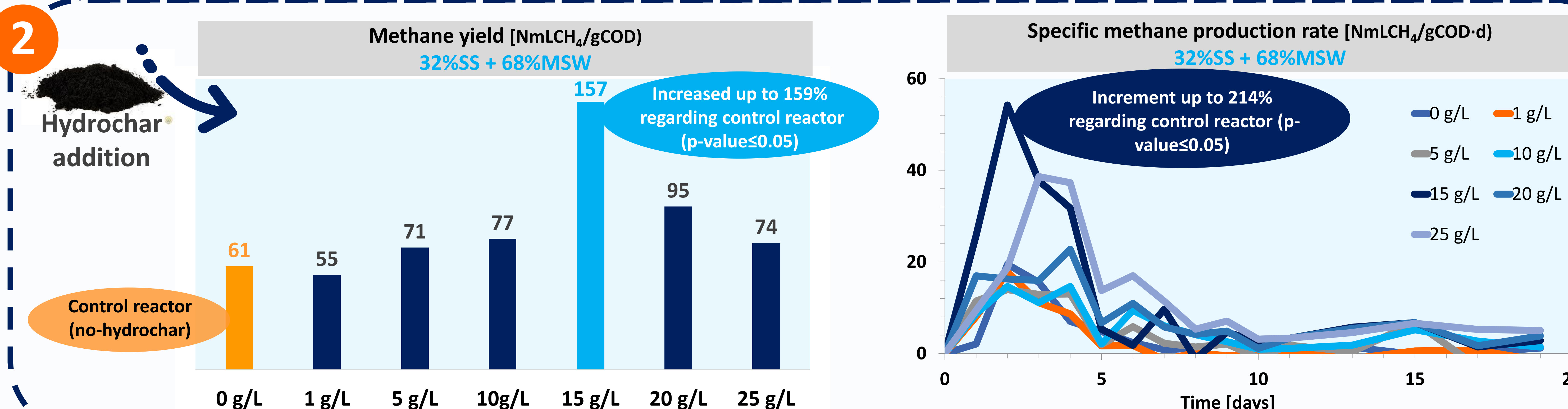
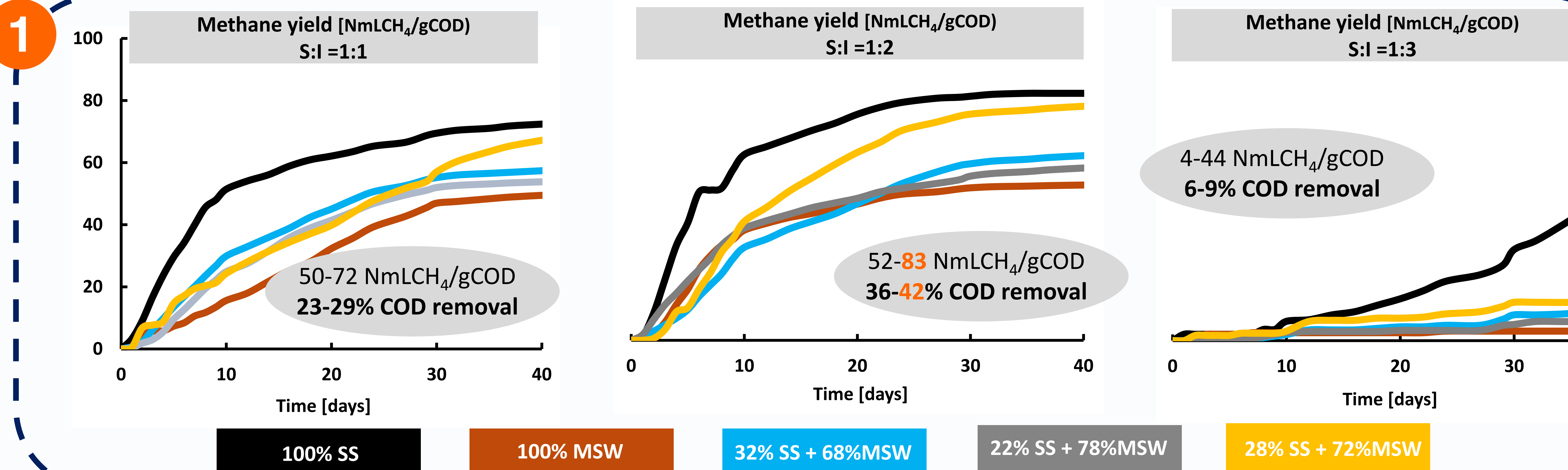
OBJECTIVE

- To investigate **the effect of different substrate to inoculum ratio (SIR)** on the methane yield (Y_{CH_4}) and the organic matter degradation of different HTC-liquid fraction from mixed biomass (sewage sludge and the organic fraction of municipal solid waste).
- To investigate **the effect of hydrochar addition** on the methane yield and the specific methane production rate ($rs_{CH_4_{max}}$) of the HTC-liquid fractions from mixed biomass.

WHAT WE DID?



WHAT WE GOT?



TAKE-HOME MESSAGE

- The SIR had a significant impact on the Y_{CH_4} and the tCOD removal efficiency.
- SIR of 1:3 reduced methane production while SIR of 1:2 obtained the best results.
- Hydrochar significantly improved Y_{CH_4} and $rs_{CH_4_{max}}$ reaching up to 159% and 214% more than control reactor.
- Hydrochar reduced the lag phase at lower doses (1, 5 and 10 g/L), while higher concentrations showed an increment.
- It was showed the feasibility of using the HTC-liquid fractions to produce methane in a combined HTC-AD system.

Acknowledgments



References

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