

INORGANIC SALTS EFFECT ON WHEAT STRAW DURING STEAM EXPLOSION TREATMENT

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Background

Wheat straw is an abundant low cost byproduct. Its use is usually limited in litter and cattle feed. In order to better valorize this lignocellulosic biomass in high added value products, a material preliminary fraction should be done.

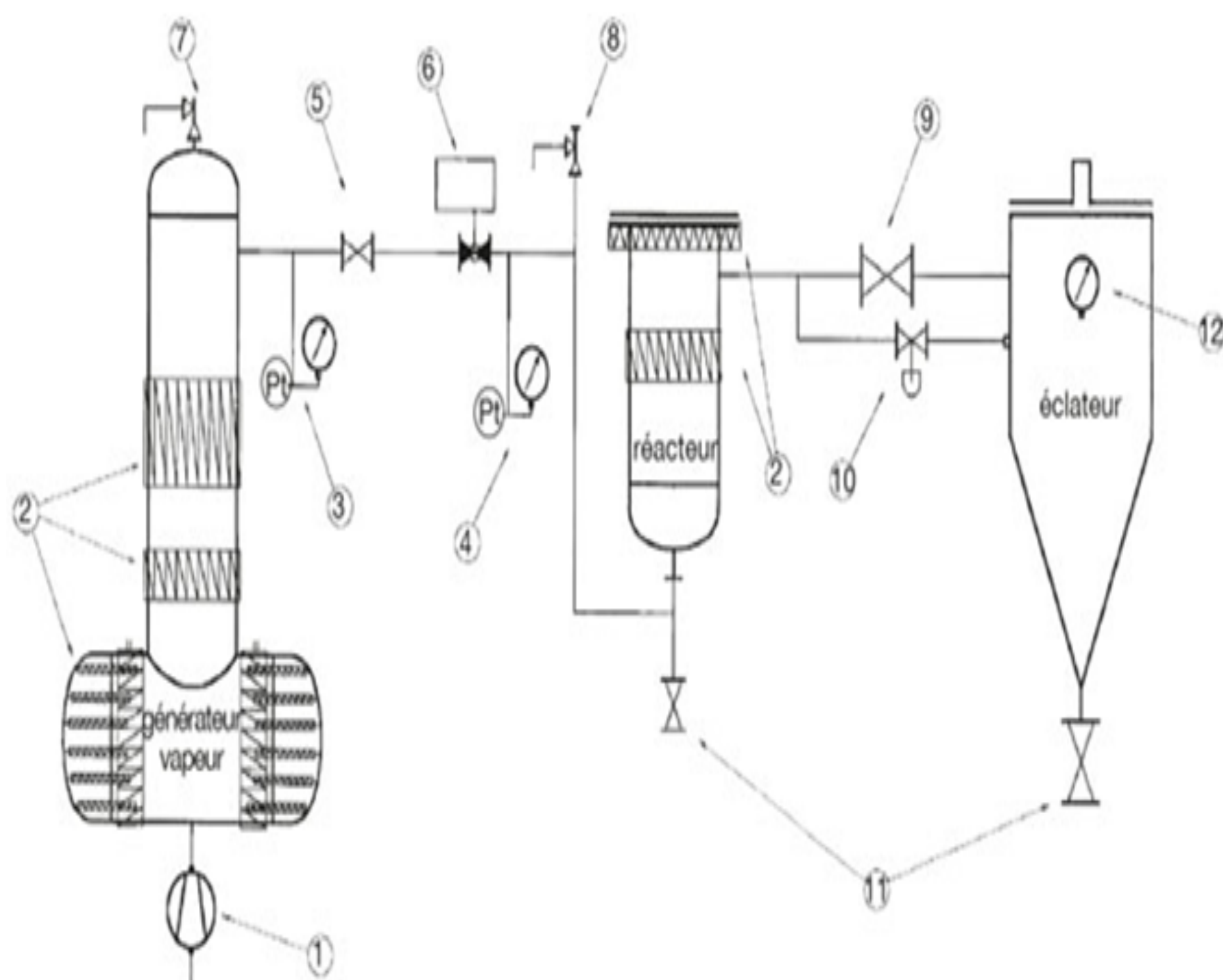
In this study, a steam explosion pretreatment was applied at different pressure (15 and 20 bars) with a residence time of 2 min using different solvents (distilled water and salt water : 35g/l NaCl).

The objective is to investigate the effect of the operating parameters combine to salt on the extraction yield of different molecules and their degradation products.

Material



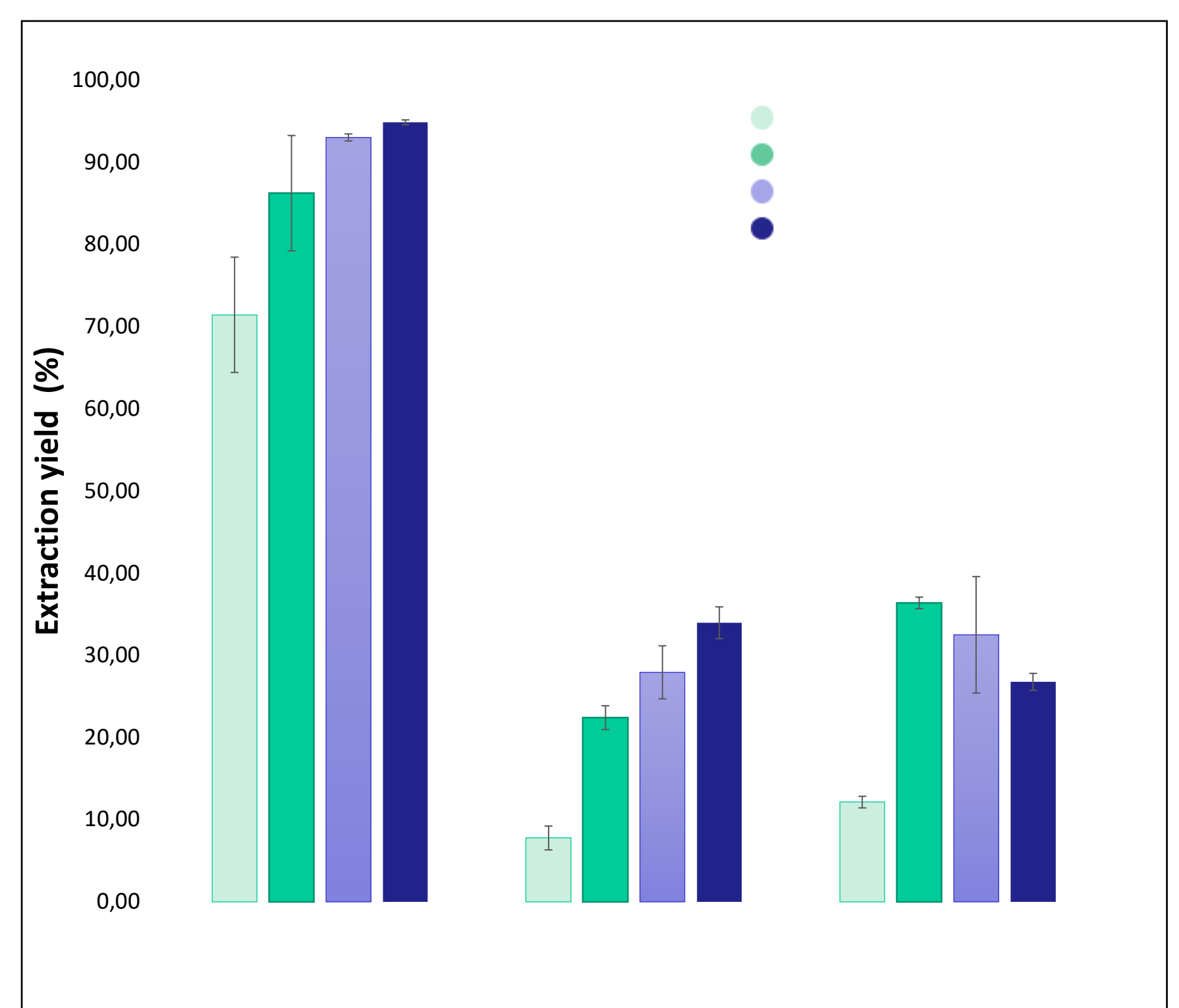
Steam explosion equipment : Biomass and Green Technologies laboratory



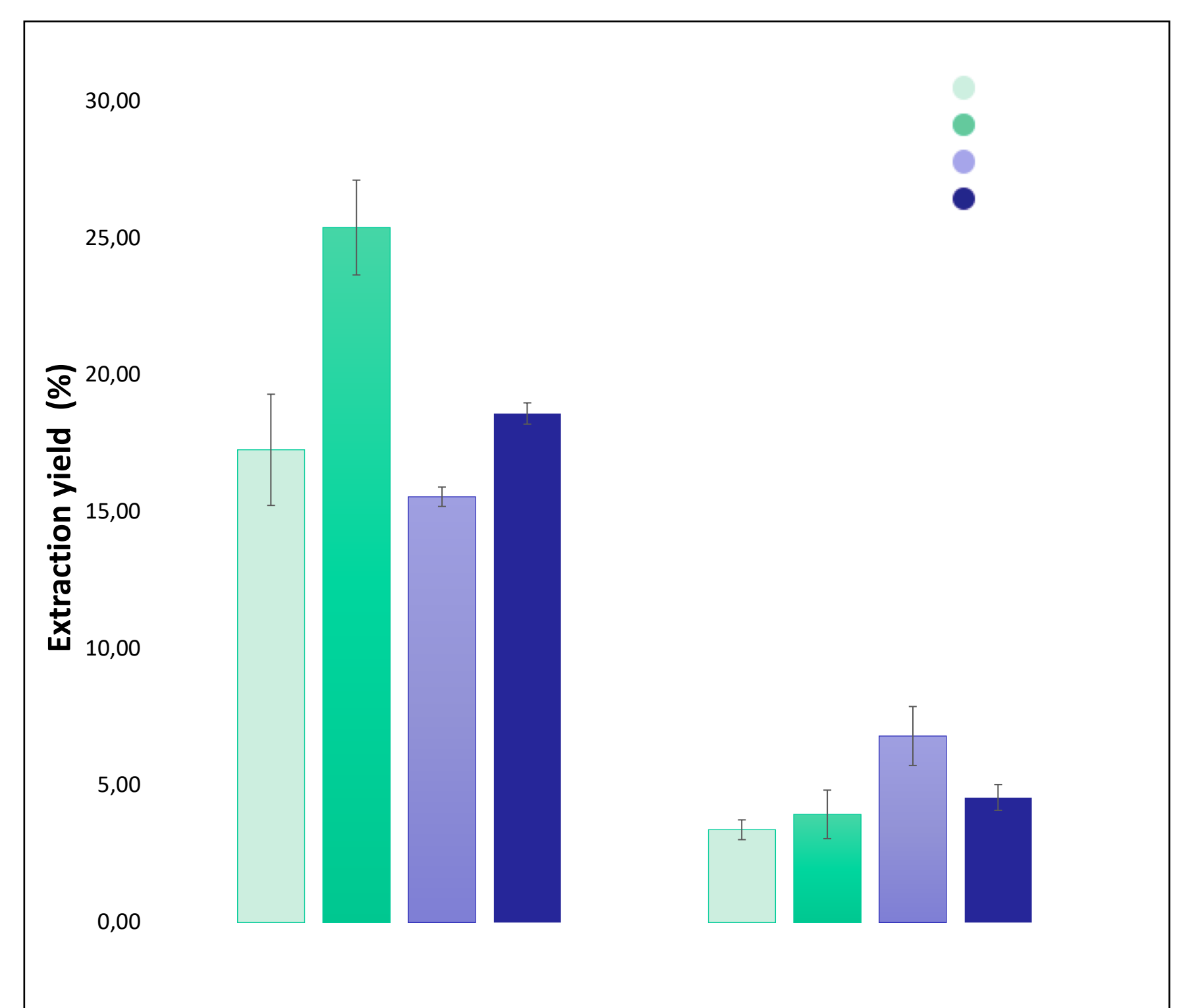
General diagram of a steam explosion installation (Jacquet et al., 2015)

1. High pressure pump, 2. Heater, 3. Steam boiler indicators, 4. Reactor indicators, 5. Insulation valve, 6. Charge valve, 7. Steam boiler safety valve, 8. Reactor safety valve, 9. Explosion valve, 10. Drain valve, 11. Recovery valves, 12. Tank gauge explosion.

Results

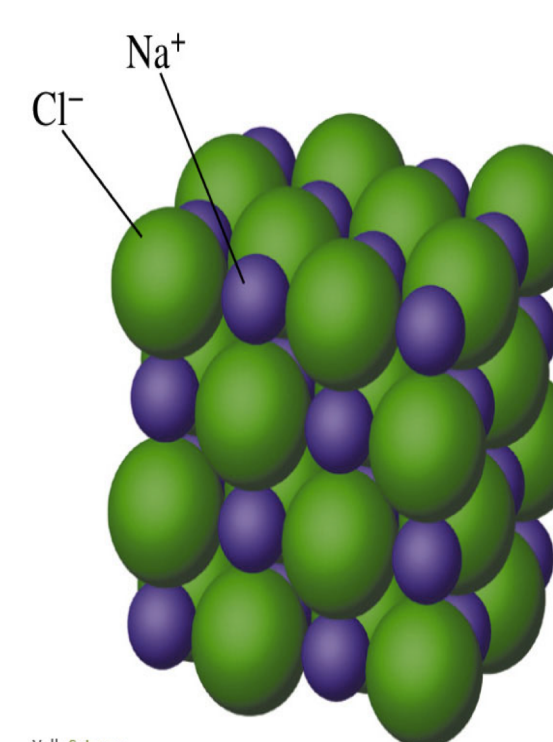


Extraction efficiency of main lignocellulosic biomass components



Free sugars recovery and degradation products obtained

Conclusion



Enhance hemicellulose, cellulose and lignin extraction at the lowest steam explosion intensity (15 bars)

Improve free sugars extraction at low pretreatment intensity

Has a few impact on the production of degradation products

Reference

Jacquet, N., Quiévy, N., Vanderghem, C., Janas, S., Blecker, C., Wathélet, B., ... Paquot, M. (2011). Influence of steam explosion on the thermal stability of cellulose fibres, *96*, 1582–1588.