

Master Thesis

Influence of nanobubble dosage on the oxidation of white liquor

Purpose of the study is to investigate possible improvements on the process of white liquor (WL) oxidation by using nanobubble dosage. Using sodium hydroxide (NaOH) as an alkali source in an oxygen delignification (OD) stage increases the cost of the process and creates imbalance in Na/S ratio in the recovery cycle. Replacing NaOH with oxidized white liquor (OxWL) in the OD stage prevents these problems. It is known that during the WL oxidation sodium sulfide (Na_2S) is converted to thiosulfate ($\text{Na}_2\text{S}_2\text{O}_3$) - partially oxidized white liquor - or to sulfate (Na_2SO_4) - fully oxidized white liquor.

The oxidizing agent used for producing OxWL is air, oxygen enriched air, or pure oxygen. Distribution and solution of the gas is a critical factor for the control of this reaction.



Overall, it shall be proven if adding the oxidant gas in form of nanobubbles can improve the speed and completeness of the reaction, allowing a capacity increase of the oxidation process.

A detailed conceptual modeling for this study as well as time schedule and laboratory tests will be defined together with the University partner.

Industrial Partner: Messer Group (Bernhard Thaller, Joachim Rohovec)

University partner: TU Graz (Rene Eckhart, Ulrich Hirn, Roman Poschner)

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Start date: to be defined; ~Summer 2021

Place of work: TU Graz

Salary: €1030.- per month, 6 month contract