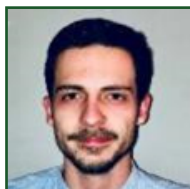


## Sulfur Recovery: A New Process to Remove SO<sub>2</sub> From a Flue Gas and Produce a Marketable Bisulfite Solution



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Sulfur Dioxide (SO<sub>2</sub>) is an important pollutant in most industrial sectors, including waste incineration. It is necessary to control its emission into the atmosphere. When this gas is present in sufficiently large quantities in the flue gas, it can also be interesting to recover it.

The process studied here recovers sulfur dioxide in the form of a marketable solution of sodium bisulfite NaHSO<sub>3</sub> from waste incineration flue gases. The process comprises two reactors. The flue gas passes through both reactors placed in series, and the SO<sub>2</sub> is absorbed in each reactor, ensuring zero SO<sub>2</sub> emissions at the outlet of the process. The liquid phase flows through the system in counter-current to the flue gas. The first reactor is regulated at acidic pH to form the sodium bisulfite solution, while the second reactor is regulated at basic pH to form the absorption solution of the first reactor, a sodium sulfite solution Na<sub>2</sub>SO<sub>3</sub>.

The process was studied in the laboratory using a synthetic gas under controlled conditions. The aim was to study the impact of operating conditions such as temperature and oxygen content on absorption reactions using batch tests. Subsequently, pH control tests were used to study more specifically the feasibility of the process, including the ability to concentrate the bisulfite solution. This step also enabled us to study the yields achievable in the two reactors at different control pHs.

### Biography:

Rodolphe Vautherin, 27-year-old, is a process engineer graduated from CPE Lyon in 2021. Since November 2021, as a PhD student, he's working on environmental processes at the DEEP research laboratory of INSA Lyon. As part of a thesis funded by an industrial company, he is an employee of SUEZ IWS. He specializes in processes applied to waste treatment, flue gas treatment and chemical interactions applied to the environment, such as gas-liquid interaction phenomena. His PhD thesis is closely linked to the industrial activities of SUEZ IWS. He is used to working on industrial sites and in laboratories.