**Graduation project at Tata Steel IJmuiden**

**CO2 Capture from Steel Gases ‒ using Pressure Swing Adsorption**

The steel industry contributes to nearly 7% of the total greenhouse gas emissions in the Netherlands. At Tata Steel IJmuiden, we are committed to reducing our CO2 emissions with 35 - 40% by 2030 and being CO2-neutral by 2045. To meet the target, we are exploring various options to reduce our CO2 emissions. One of the options is to capture CO2 from the steel plant’s works arising gases using pressure swing adsorption (PSA) technique.

The research activities in this assignment include:

* Modeling a dynamic PSA cycle operation for CO2 capture from steel gases using MATLAB/Aspen Adsorption tool, testing and validation of the model
* Extensive optimization of the different PSA cycle steps, with the focus on achieving reduced CO2 capture cost
* Testing of the PSA cycle for different steel gas mixtures (top gases from blast furnace, basic oxygen furnace, direct reduced iron furnace)
* Studying the influence of trace pollutants like NH3, H2S, COS present in the steel gases on the adsorbent material
* Making a process flow design of the PSA system integrated to the steel plant gas network using flowsheeting tool

Duration: 7.5-9 months

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