

TNO Science and Industry



TNO report

CATO-D2.3.03

Chemical looping combustion inside & outside CATO

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Assignor	
Project number	004.35107/01.29
Classification report	Confidential
Title	
Abstract	
Report text	
Appendices	
Number of pages	11 (incl. appendices)
Number of appendices	

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Public summary

The work described in this report is part of the activities in work package 2.3 of CATO.

Chemical-looping combustion (CLC) can be a interesting technique for producing clean energy. The main advantage of CLC over conventional processes is that direct contact between fuel and air is circumvented, so that carbon dioxide is obtained without nitrogen dilution and intrinsically expensive CO₂ separation. This is achieved by contacting air and fuel via an intermediate oxygen carrier that is alternately exposed to oxidizing and reducing conditions. The heat produced during the exothermic oxidation reaction is used to drive the downstream gas turbine. During the reduction reaction, which is usually endothermic, a mixture of CO₂ and H₂O is produced, from which pure CO₂ can easily be obtained.

This report presents the work performed at TNO and university Twente. The discussed topics are:

- Perovskite particles as oxygen carrying material
- Packed bed chemical looping reactor
- Membrane assisted chemical looping reactor

The rest of the report is confidential