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# Validation of the oxygen buffering ability of bed materials used for ocac in a large scale cfb boiler

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**Fredrik Lind, Angelica Corcoran and Henrik Thunman**


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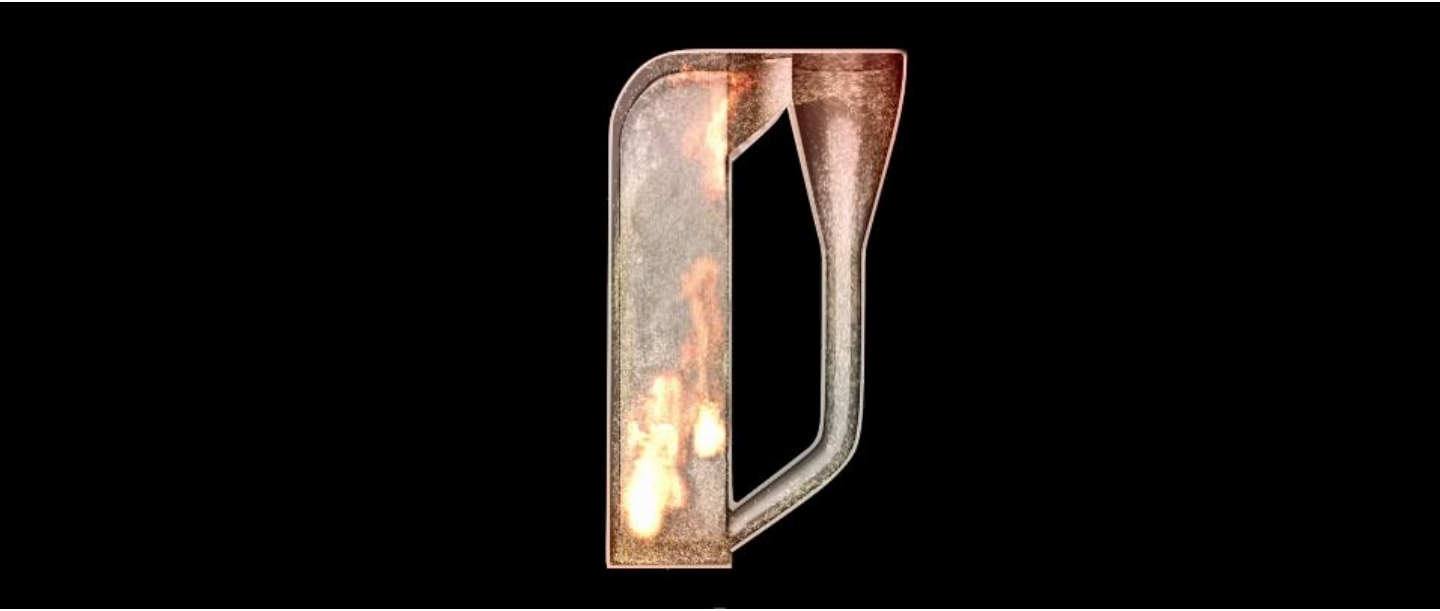
**May 23rd, 2016**

Fluidization XV – Fairmont Le Chateau Montebello
Quebec, Canada

# Circulating Fluidized Bed boilers



# Background to OCAC

- Spinoff from Chemical Looping Combustion
- Addition of ilmenite as part of bed inventory
- Possibility to provide an increased oxygen distribution

# Oxygen Carrier Aided Combustion

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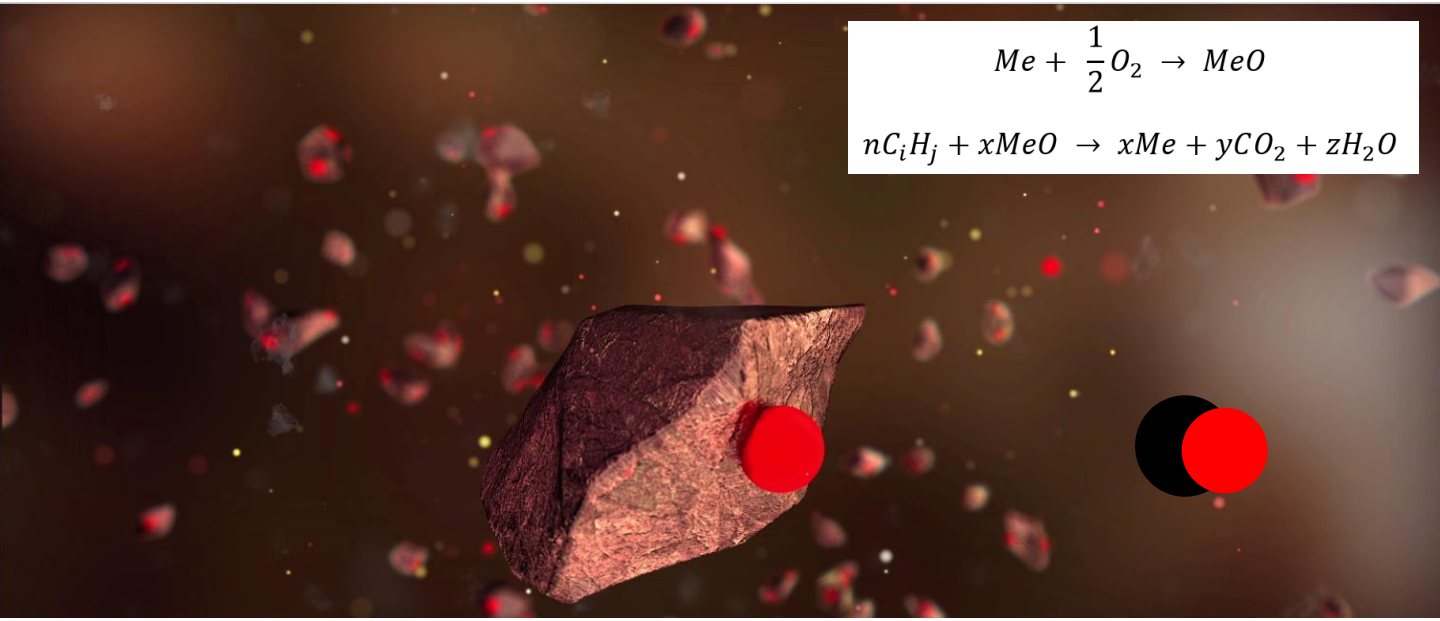
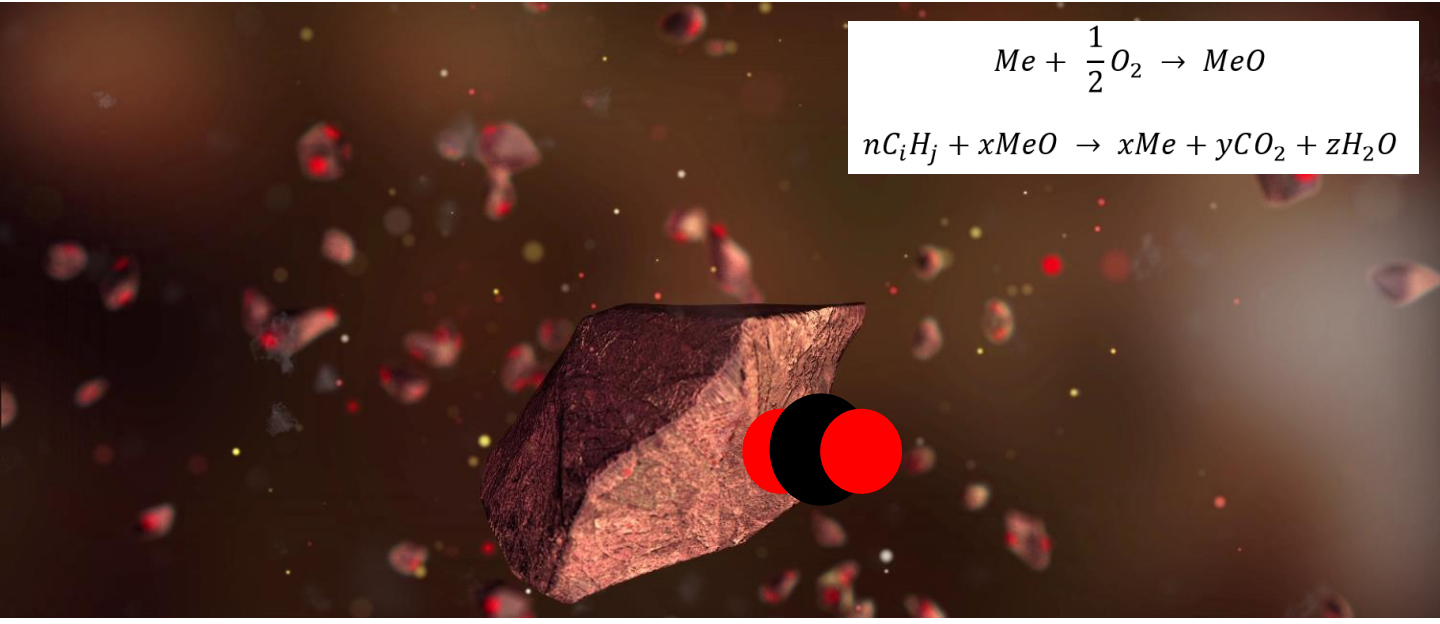


# Oxygen Carrier Aided Combustion



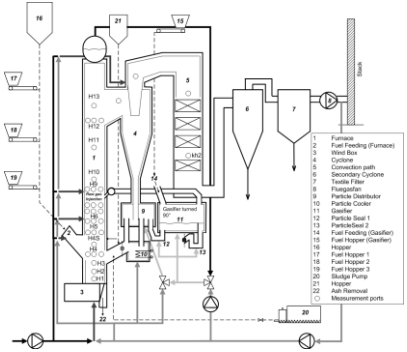
# Aim: Validation of the OCAC concept

- Earliest investigation with 100% ilmenite in industrial relevant CFB conditions
- Evaluate oxygen buffering ability experimentally
- Validate experiments by identifying conceptual patterns with a dynamic pulse response

# Research from lab to commercial scale

E.ON commercial waste boiler 80MWth

Chalmers 12MWth research boiler



Labscale reactor

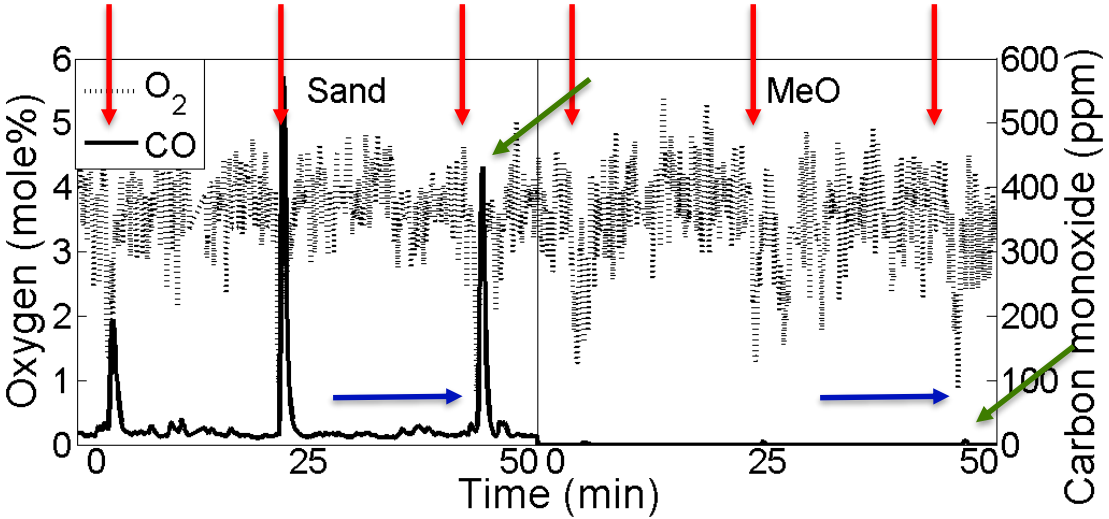
Continuous operation since February 2016

2013 — 2014 — 2014 - 2016

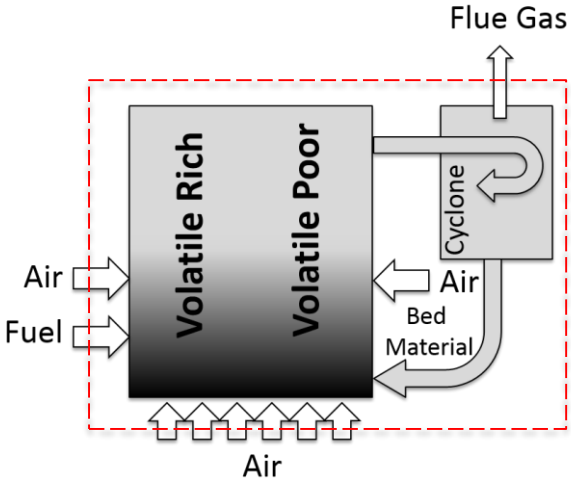
# Experimental: Procedure and Results

- Reference case with 100% silica sand was compared to operation with 100% ilmenite

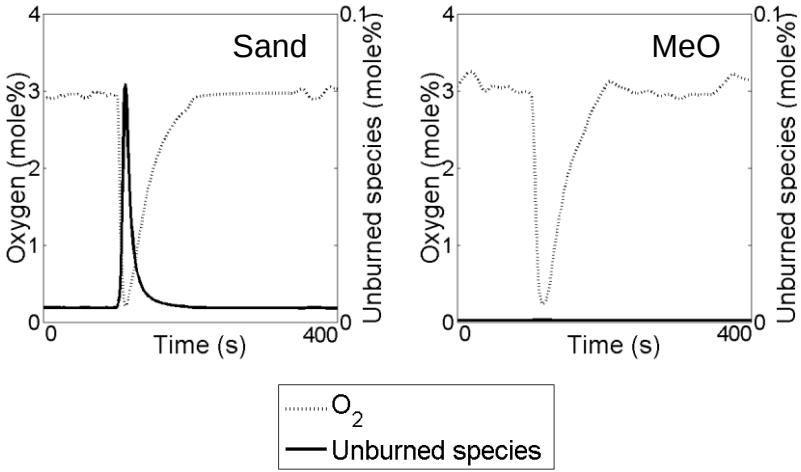
- Instantaneous fuel pulse of 8MW on top of the 6MW base load



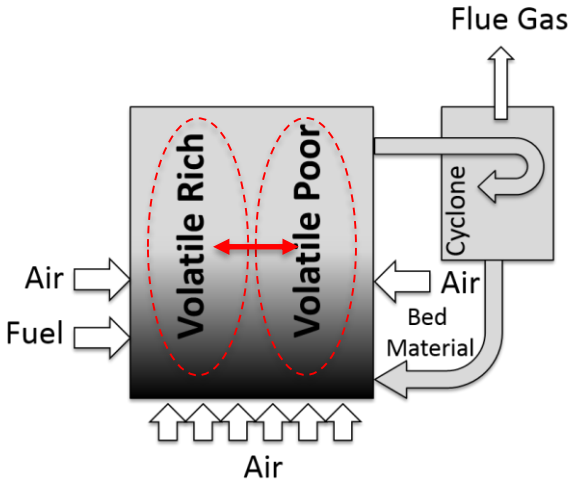
# Dynamic pulse response

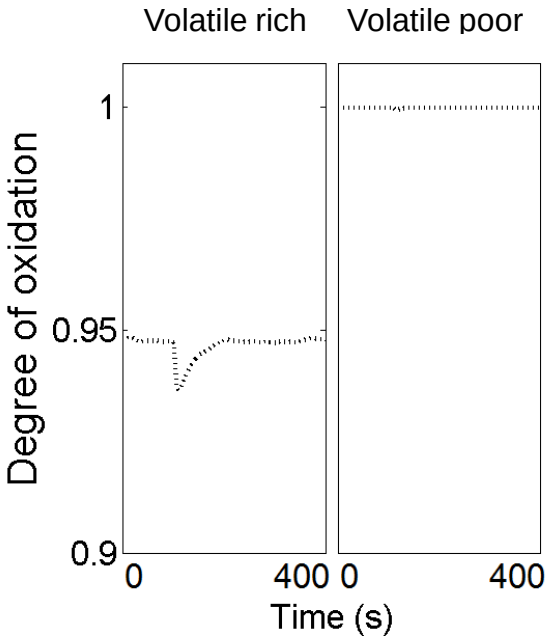



## Flue gas concentrations



# Dynamic pulse response



# Concluding remarks

- Initial experience with MeO in large scale
- MeO has oxygen buffering properties
- Enhanced utilization of oxygen in time and space

# Thank you!

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