p-TGA

Group 2
Linda, Pontus & Frida

p-TGA

- Provides weight change-rate

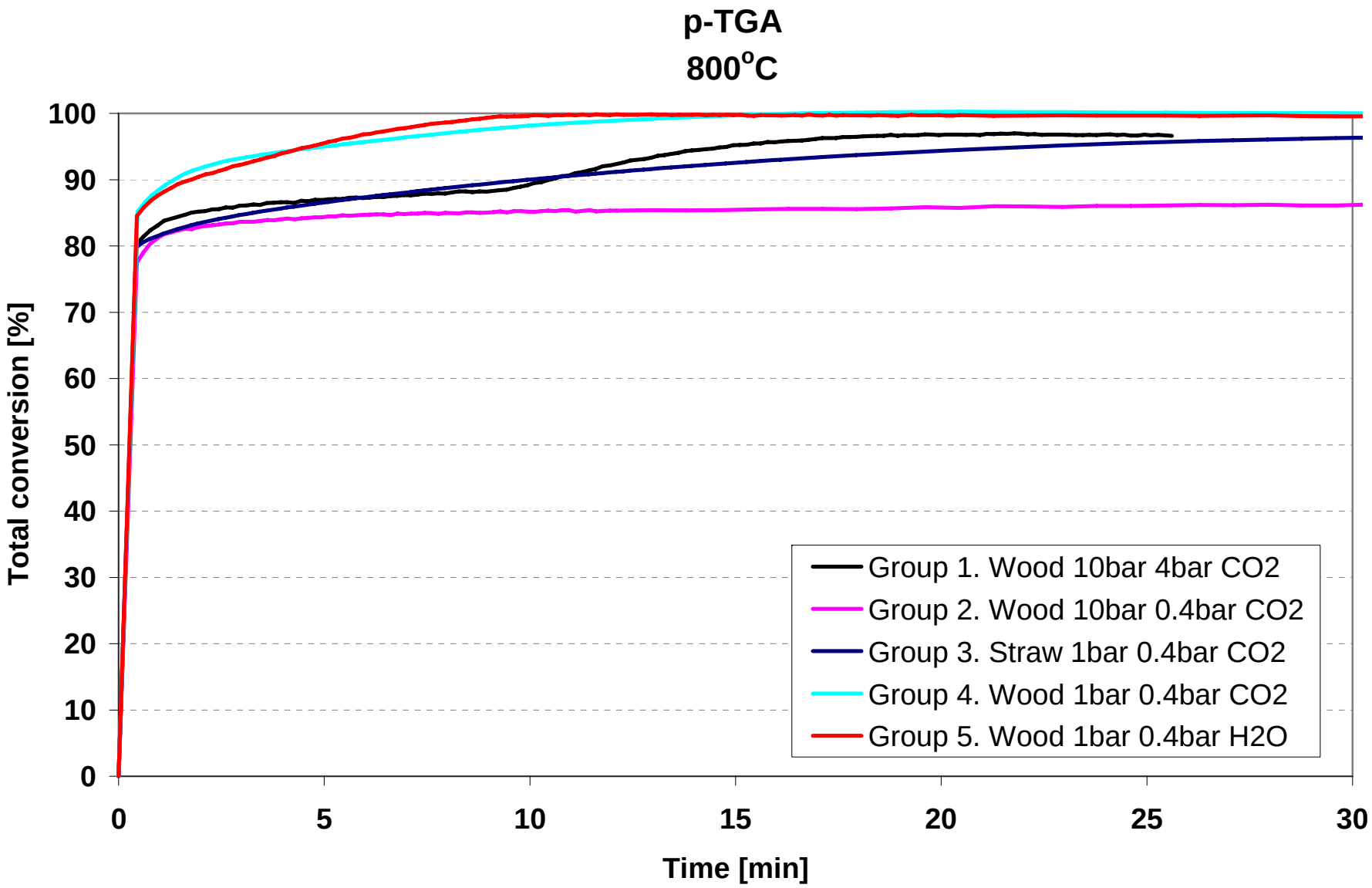
- Research areas:

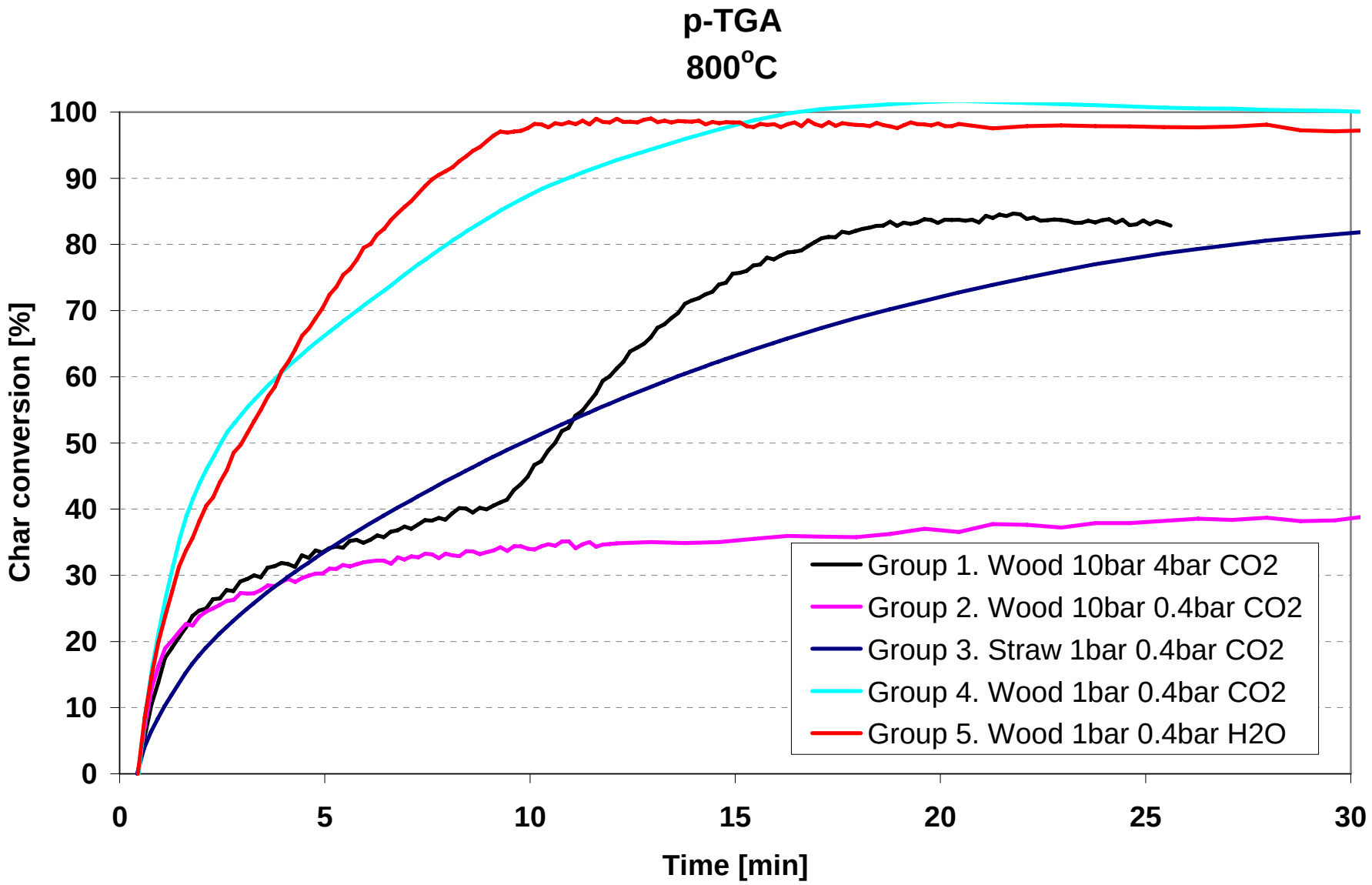
- Study kinetics of char gasification/oxidation
- Study adsorption reactions
- Study combustion chemistry

Experimental plan

Sample	T(C)	P_{tot} (bar)	P_{CO2} (bar)	P_{H2O}(bar)	Group
Wood	800	1	0.4	0	4
Straw	800	1	0.4	0	3
Wood	800	10	0.4	0	2
Wood	800	10	4	0	1
Wood	800	1	0	0.4	5

Results


p-TGA
800°C
Total conversion [%]
100
90
80
70
60
50
40
30
20
10
0
0
5
10
15
20
25
30
Time [min]
Group 1. Wood 10bar 4bar CO2
Group 2. Wood 10bar 0.4bar CO2
Group 3. Straw 1bar 0.4bar CO2
Group 4. Wood 1bar 0.4bar CO2
Group 5. Wood 1bar 0.4bar H2O


p-TGA
800°C
Char conversion [%]
Time [min]
0
10
20
30
40
50
60
70
80
90
100
0
5
10
15
20
25
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Suggestion for further experiments

- Repeat measurement for wood 10bar, 4bar CO_2
- Perform test on wood and straw chars after pyrolysis at same temperature in N_2
- Measure gas composition of the product gas during measurement
- Investigate effect of temperature

Evaluation of method

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- Can be used for fuel comparisons
- Can provides some information on T, P and gas composition
- More equipment can be added and give information about combustion gases, tar and formed particles
- Simple method
- Possibility to use pressure in this set-up

Evaluation of method

- Reaction takes place before program starts (set-up not suitable for fast reactions)
- The fuel need to be prepared and does not always represent the ”true” case
- Not possible to study chemical kinetics at higher temperatures (>800C), due to mass transfer-control

Google

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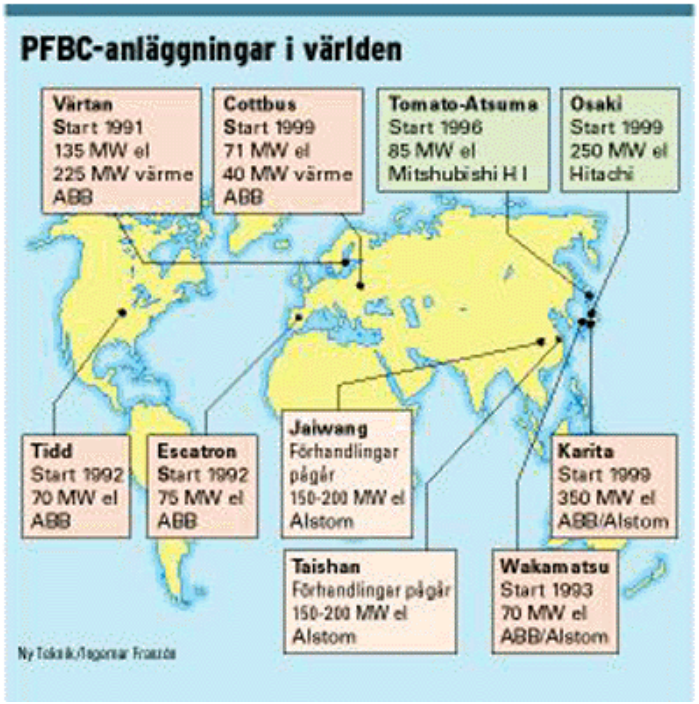

2009

Cleaner Coal Plants May Use Pressurized Combustion System To Capture Carbon Dioxide

ScienceDaily (Sep. 23, 2009)

— Researchers at MIT have shown the benefits of a new approach toward eliminating carbon-dioxide (CO2) emissions at coal-burning power plants.

(http://www.sciencedaily.com/releases/2009/09/090921134834.htm)