CO_2 capture from a binary CO_2/N_2 and a ternary $CO_2/N_2/H_2$ mixture by PSA: experiments and predictions

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1 Experimental and simulation results from binary PSA experiments
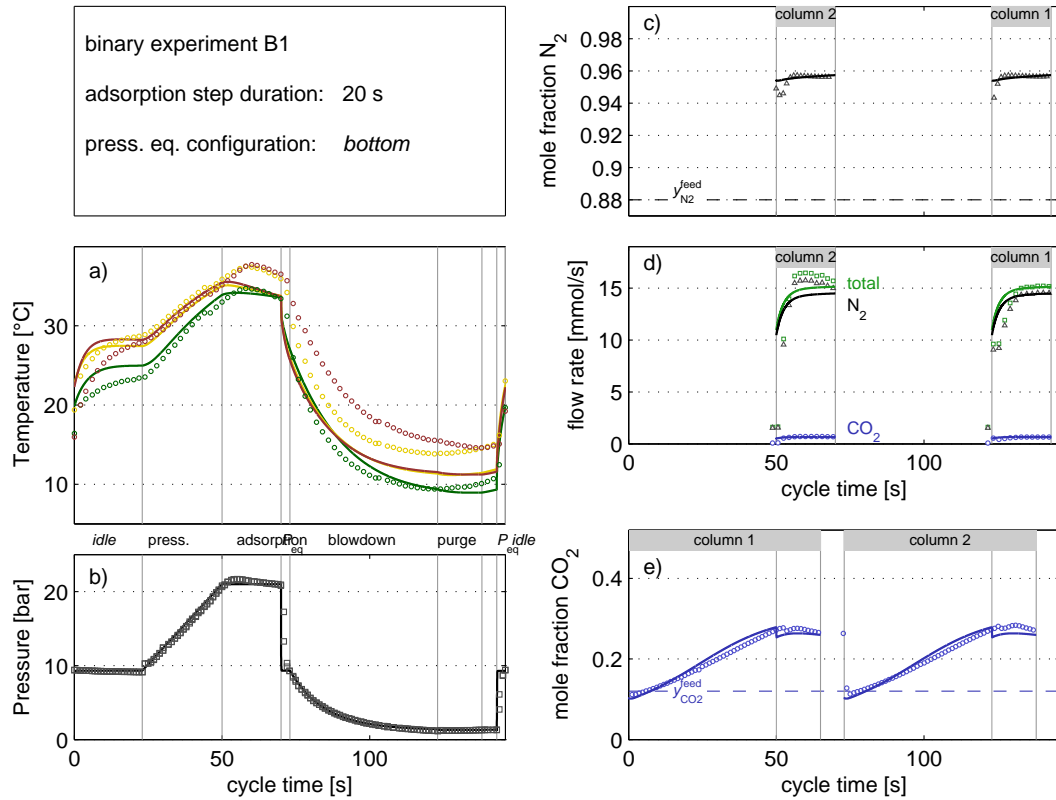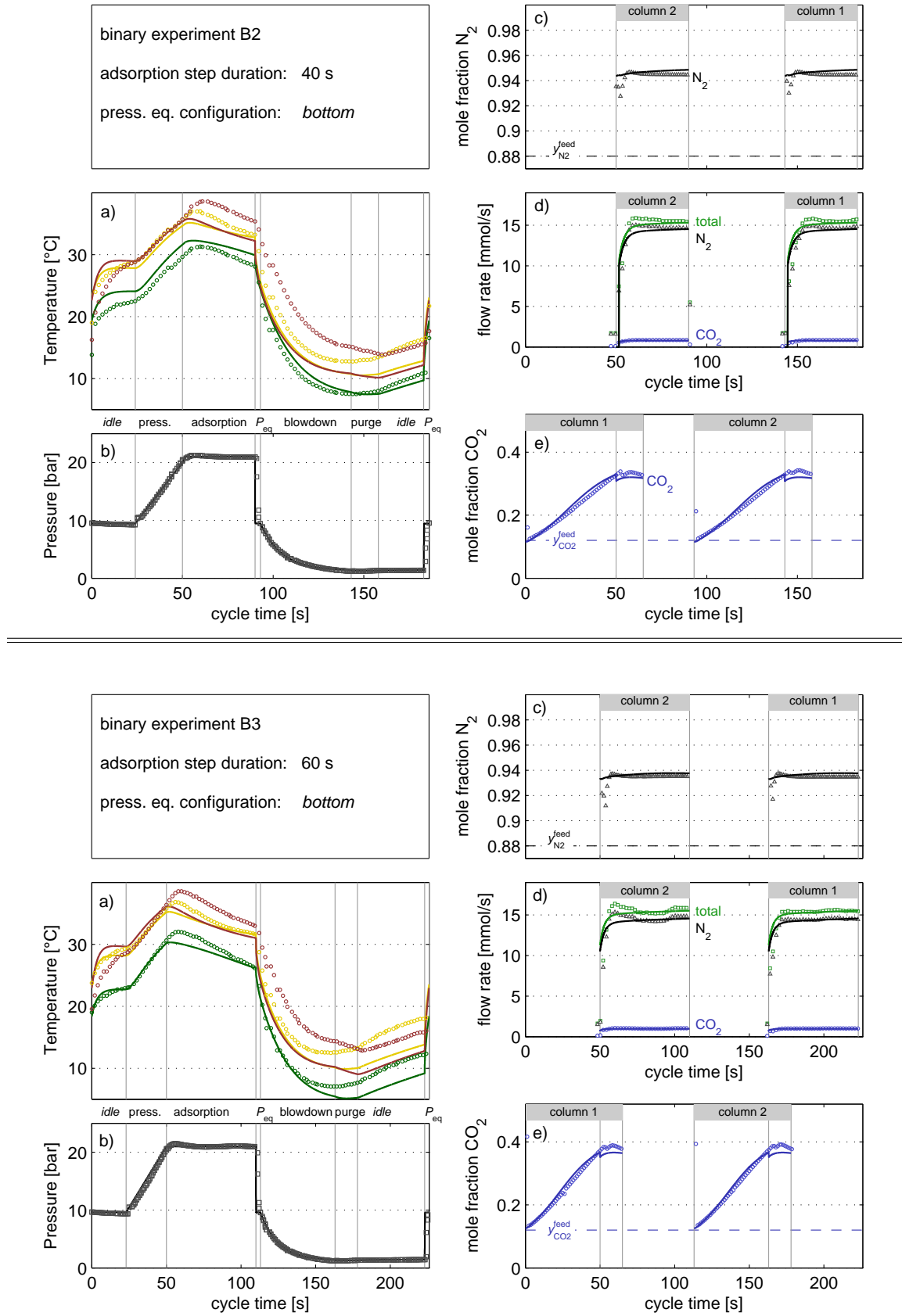

Figure S1: Experimental and simulation data for one full cycle of experiment B1.
a) Temperature at three location in column 2: 10 cm (green), 60 cm (yellow), and 110 cm (red) from the bottom.
b) Pressure measured at the bottom of column 2.
c) Composition of the light product as measured by the MS.
d) Flow rate of the light product, along with component-specific flow rates.
e) Composition of the heavy product.

Figure S2: Experimental and simulation data for one full cycle of experiments B2 (top) and B3 (bottom).

a) Temperature at three location in column 2: 10 cm (green), 60 cm (yellow), and 110 cm (red) from the bottom.

b) Pressure measured at the bottom of column 2.

c) Composition of the light product as measured by the MS.

d) Flow rate of the light product, along with component-specific flow rates.
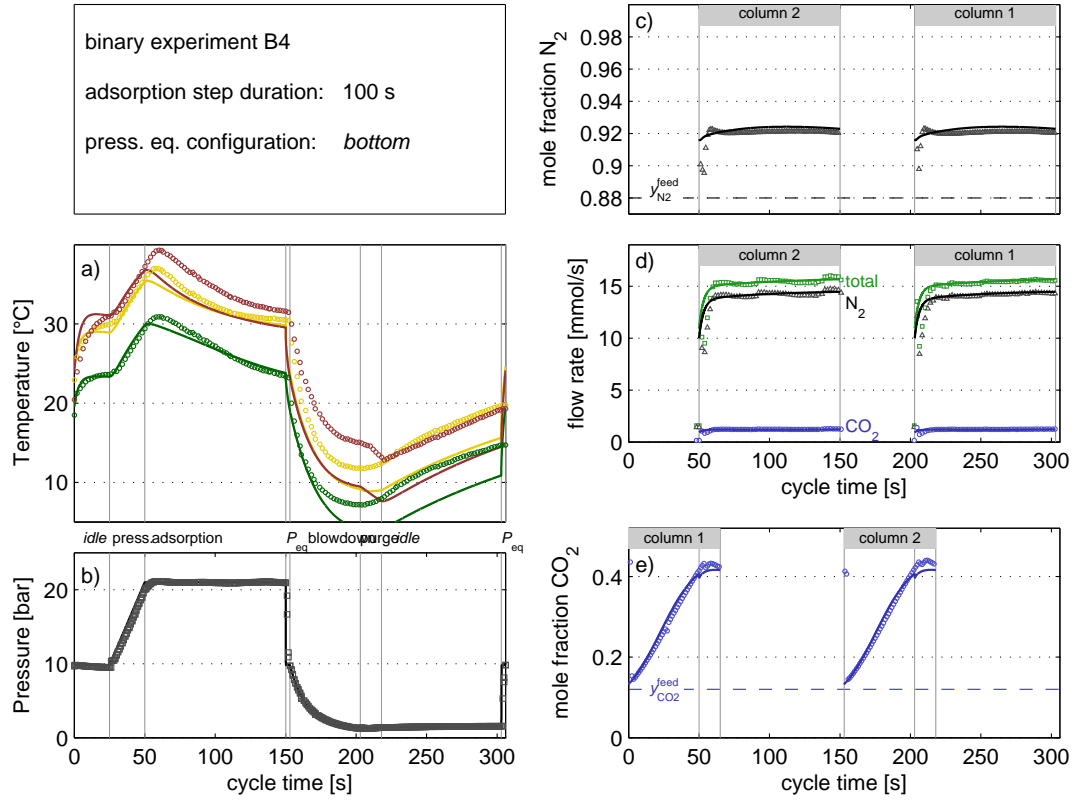
e) Composition of the heavy product.

Figure S3: Experimental and simulation data for one full cycle of experiment B4.
a) Temperature at three location in column 2: 10 cm (green), 60 cm (yellow), and 110 cm (red) from the bottom.
b) Pressure measured at the bottom of column 2.
c) Composition of the light product as measured by the MS.
d) Flow rate of the light product, along with component-specific flow rates.
e) Composition of the heavy product.

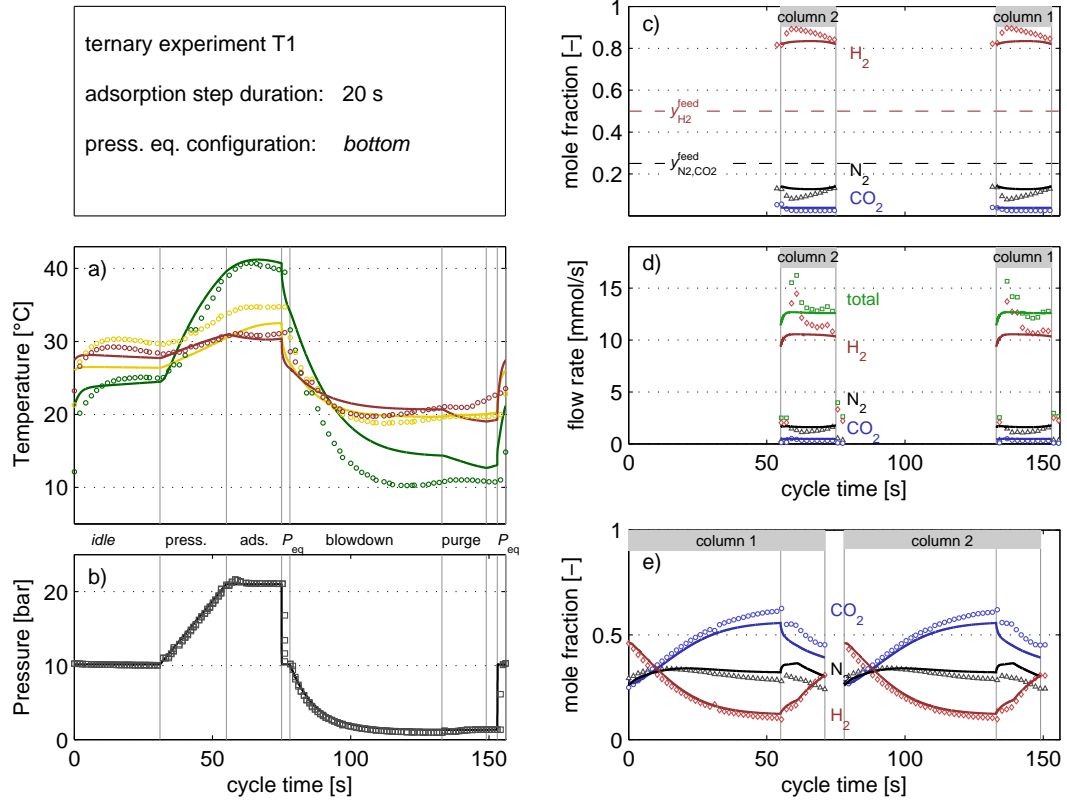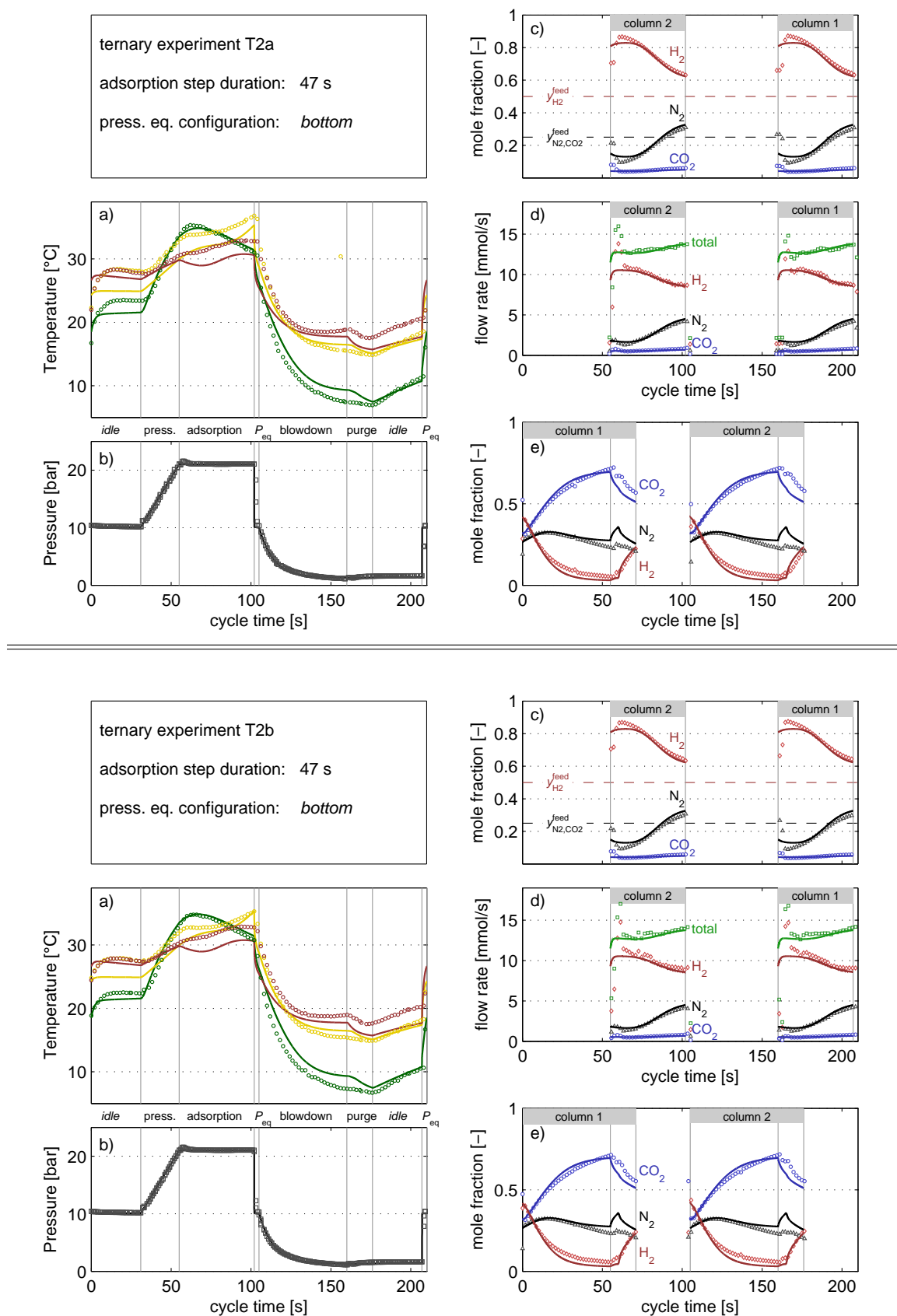# 2 Experimental and simulation results from ternary PSA experiments

Figure S4: Experimental and simulation data for one full cycle of experiment T1.

a) Temperature at three location in column 2: 10 cm (green), 60 cm (yellow), and 110 cm (red) from the bottom.

b) Pressure measured at the bottom of column 2.

c) Composition of the light product as measured by the MS.

d) Flow rate of the light product, along with component-specific flow rates.

e) Composition of the heavy product.

Figure S5: Experimental and simulation data for one full cycle of experiments T2a (top) and T2b (bottom).

a) Temperature at three location in column 2: 10 cm (green), 60 cm (yellow), and 110 cm (red) from the bottom.

b) Pressure measured at the bottom of column 2.

c) Composition of the light product as measured by the MS.

d) Flow rate of the light product, along with component-specific flow rates.

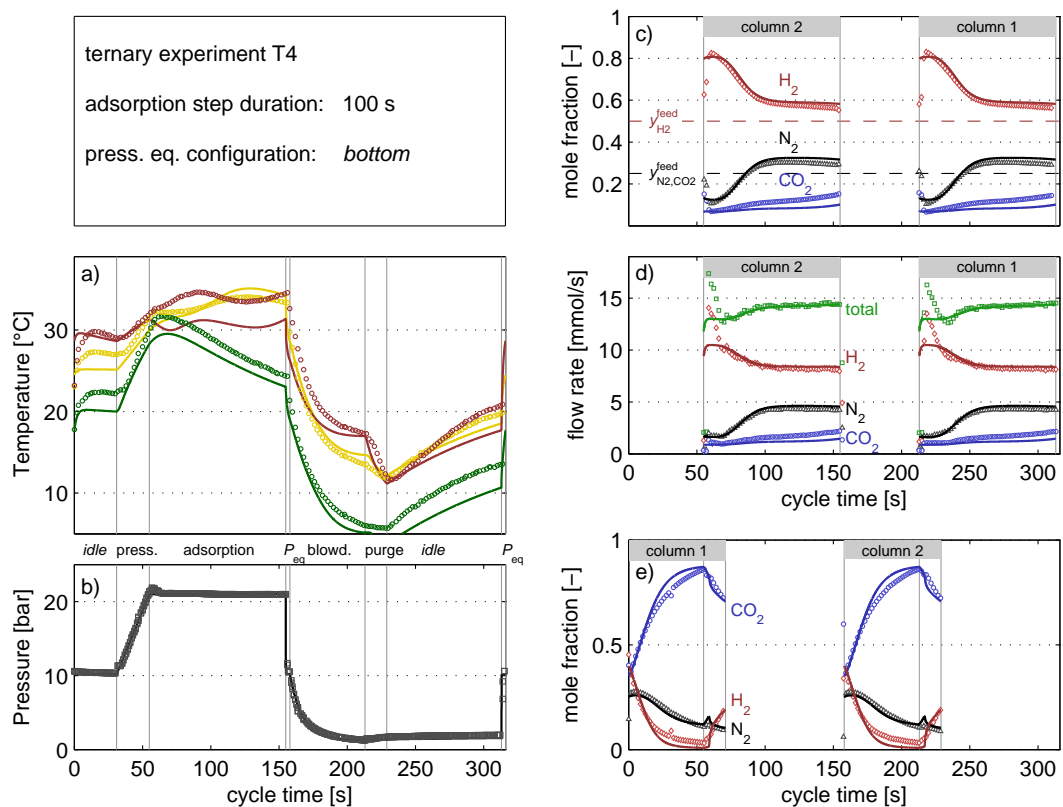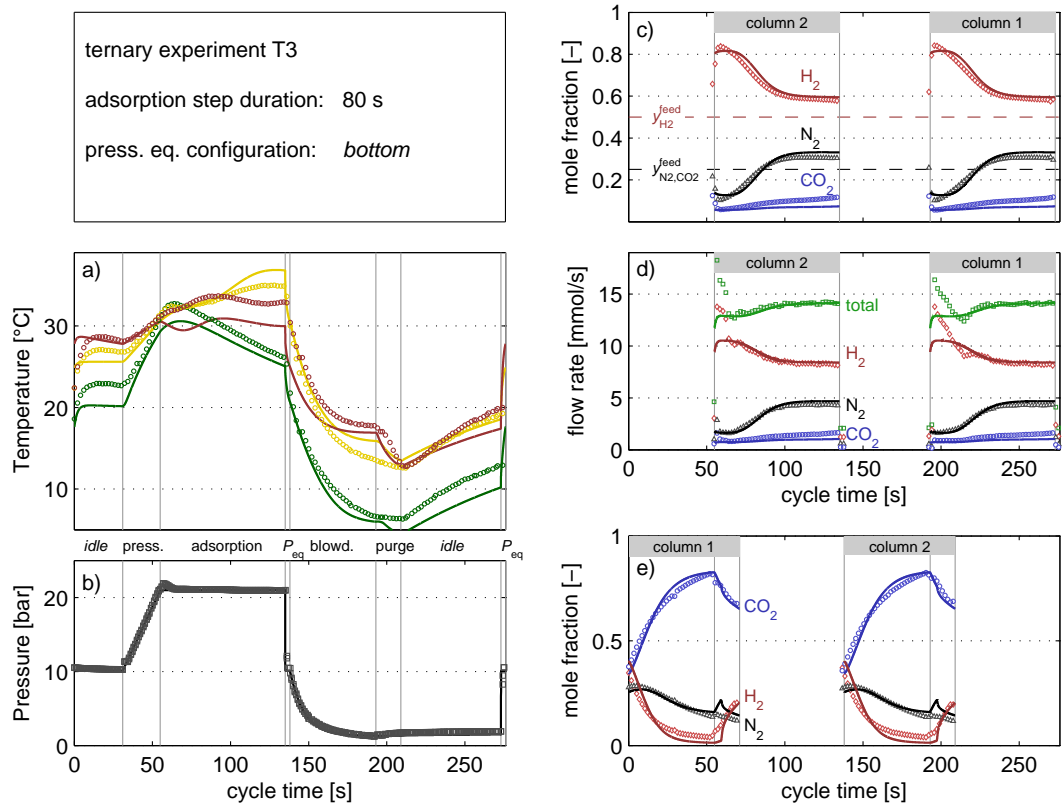e) Composition of the heavy product.

Figure S6: Experimental and simulation data for one full cycle of experiments T3 (top) and T4 (bottom), the two experiments with the longest adsorption step time.
a) Temperature at three location in column 2: 10 cm (green), 60 cm (yellow), and 110 cm (red) from the bottom.
b) Pressure measured at the bottom of column 2.
c) Composition of the light product as measured by the MS.
d) Flow rate of the light product, along with component-specific flow rates.
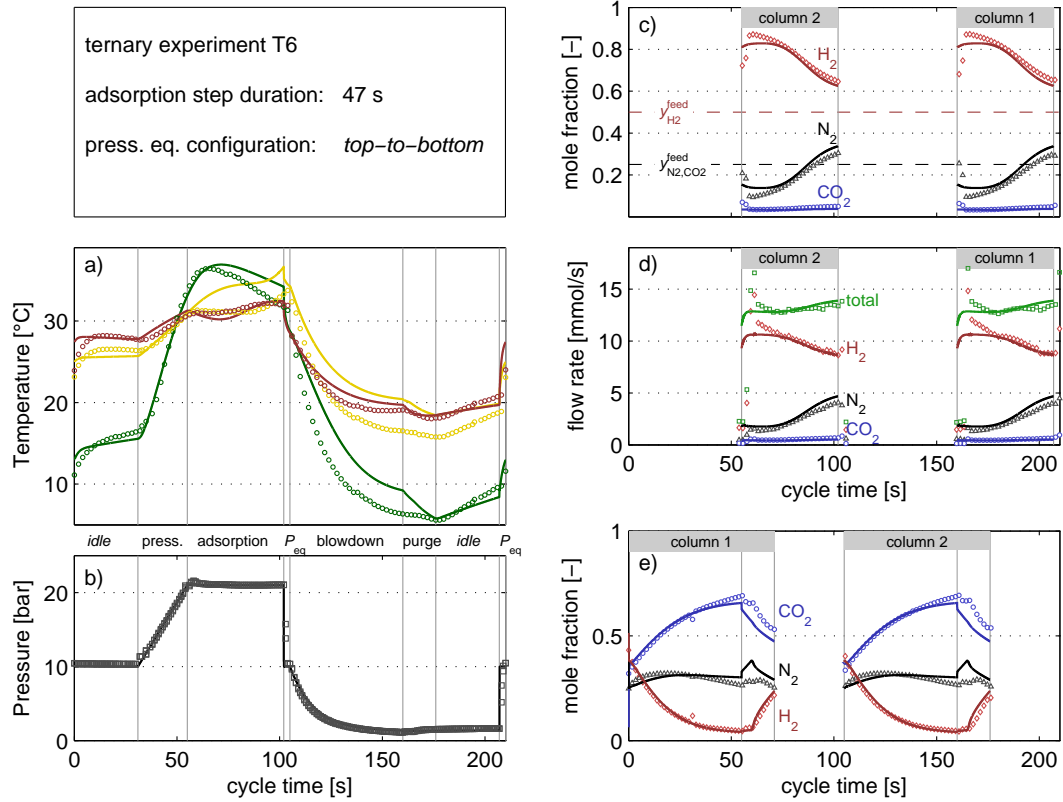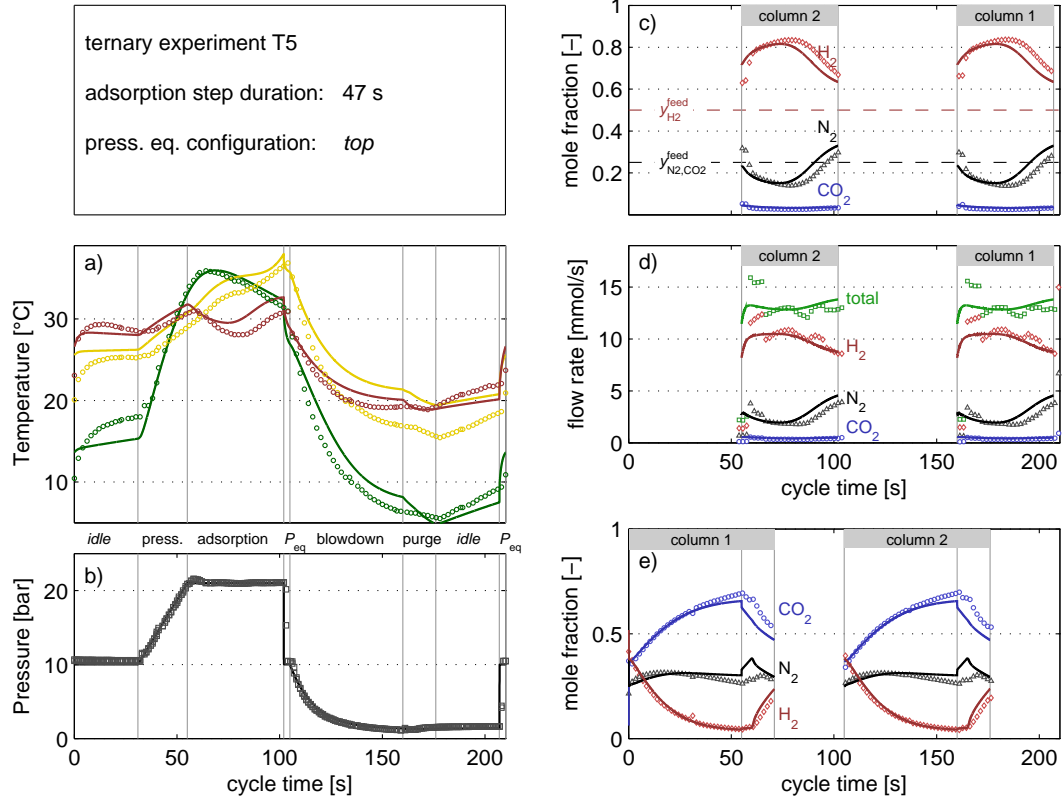e) Composition of the heavy product.

Figure S7: Experimental and simulation data for one full cycle of experiments T5 (top) and T6 (bottom), the two experiments with the alternative configurations during the pressure equalization step.
a) Temperature at three location in column 2: $10\,cm$ (green), $60\,cm$ (yellow), and $110\,cm$ (red) from the bottom.
b) Pressure measured at the bottom of column 2.
c) Composition of the light product as measured by the MS.
d) Flow rate of the light product, along with component-specific flow rates.
e) Composition of the heavy product.