Supporting Information for

Visualization of two-phase reacting flow behavior in a gas-liquid-solid microreactor

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\begin{center}
\textbf{Fig. S1} Schematic diagram of the experimental system.
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Fig. S2 Gas slug formation and pressure accumulation stages for the alternate gas slug generation.
Fig. S3 Real-time images of the interface retraction in the gas pressure accumulation stage with reaction.

($u_g = 0.050$ sccm, $u_i = 5$ μL/min, $C_{NB} = 60$ mM)
**Fig. S4** Gas slug velocity along the main channel at different gas flow rates.

\( u_l = 5 \, \mu\text{L/min}, \, C_{NB} = 60 \, \text{mM} \)

**Fig. S5** Gas pressure accumulation time at different gas flow rates.

\( u_l = 5 \, \mu\text{L/min}, \, C_{NB} = 60 \, \text{mM} \)
**Fig. S6** Gas slug velocity along the microchannel at different liquid flow rates.
(a: $u_l = 10 \mu$L/min, b: $u_l = 15 \mu$L/min, c: $u_l = 20 \mu$L/min).
**Fig. S7** The effect of inlet nitrobenzene concentration on the residence time in the field of view.

\[ u_t = 10 \, \mu\text{L/min}, \quad u_g = 0.100 \, \text{scm} \]

**Fig. S8** Variation of the nitrobenzene conversion with the increase of operation time

\[ C_{\text{NB}} = 120 \, \text{mM} \]