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Mass transfer in Taylor flow: transfer rate modelling from measurements at the slug and film scale

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**Highlights**

- Mass transfer in non-reactive gas-liquid Taylor flow studied with PLIF-I and PIV Gas and liquid were injected by T-mixer into channel of circular cross-section
- Two contrasted regimes were observed in liquid slug with transition at  $Re$  300
- Contaminants potentially cause fluctuations at bubble rear and enhance mixing in slug
- A new scaling law for overall mass transfer is proposed which relates  $Sh$  to  $Re$  and  $Sc$

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