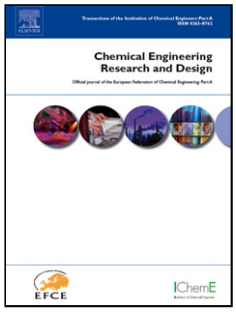

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Breakup and coalescence regularity of non-dilute oil drops in a vane-type swirling flow field

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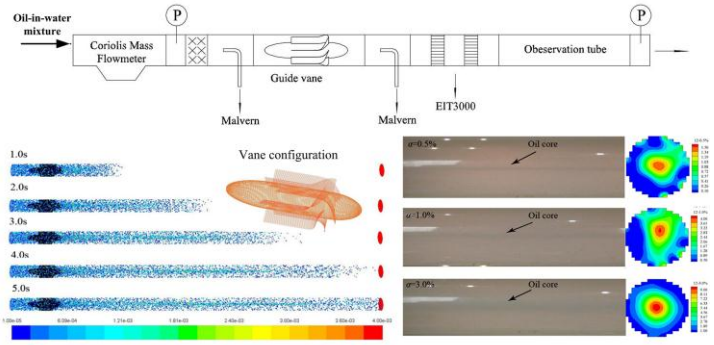
Graphical abstract



Highlights

- An experimental and numerical study on non-dilute oil drop behavior in swirling flow field was performed.
- Malvern RTsizer and Electrical Resistance Tomography were used to obtain the drop size distribution and phase concentration.
- Renormalization-group k-ε turbulent model, coupled with a discrete phase model simulating oil phase was applied.
- Oil drop behavior including breakup, coalescence and trajectory in vane-type swirling flow field was obtained.
- Regularity of swirling intense distribution and drop-turbulence interaction in a swirling flow field was established.