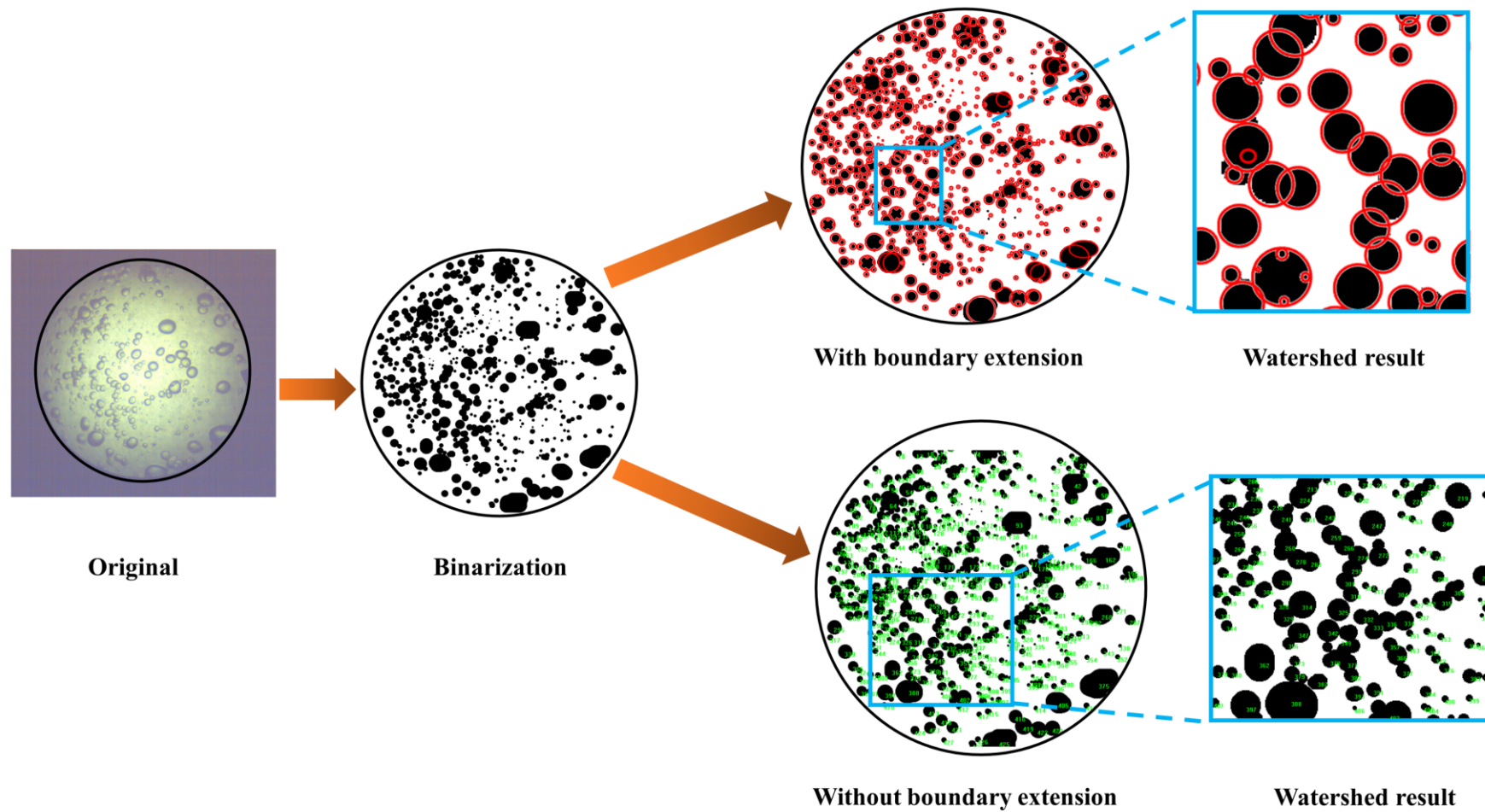
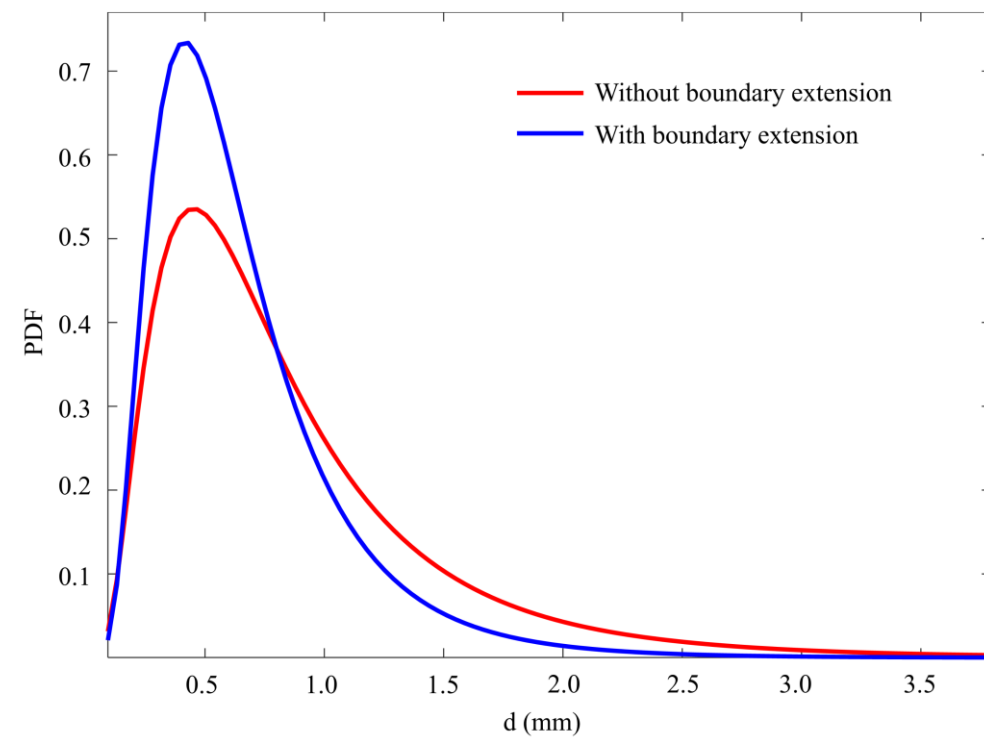
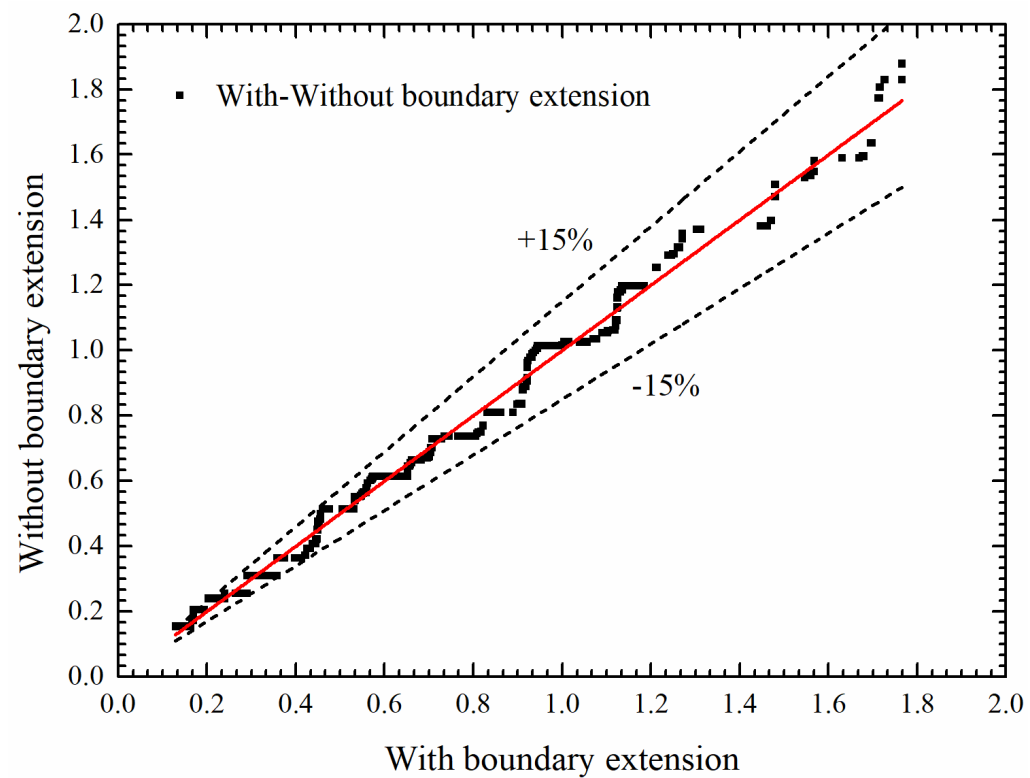


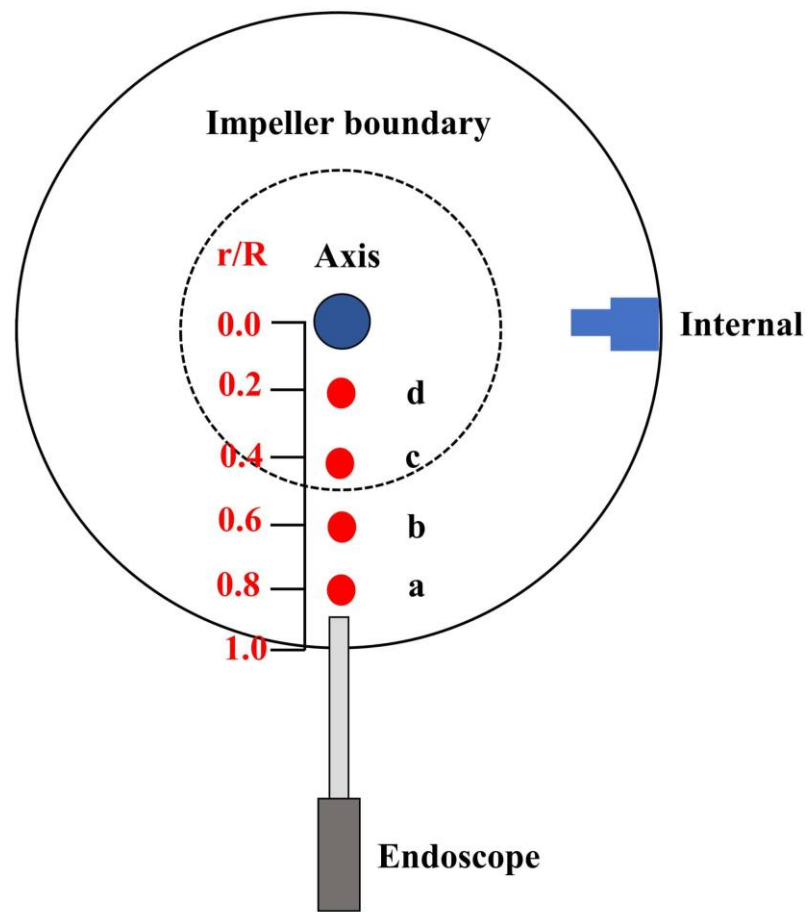
Figure 1. Experimental setup



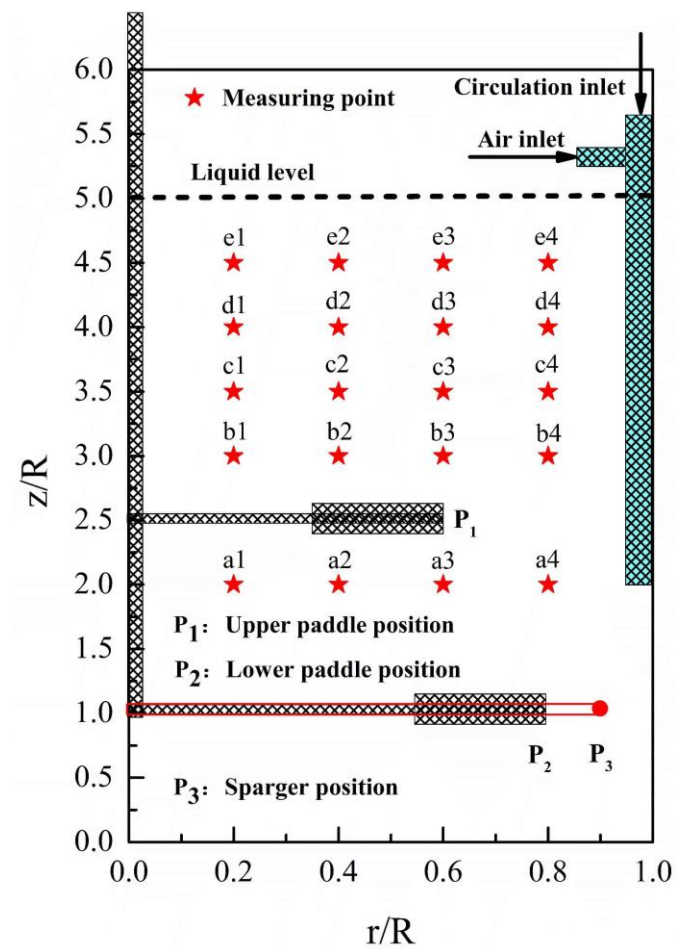
**Figure 2. Bubble image processing**



**Figure 3. Comparison of two bubble image-processing results**

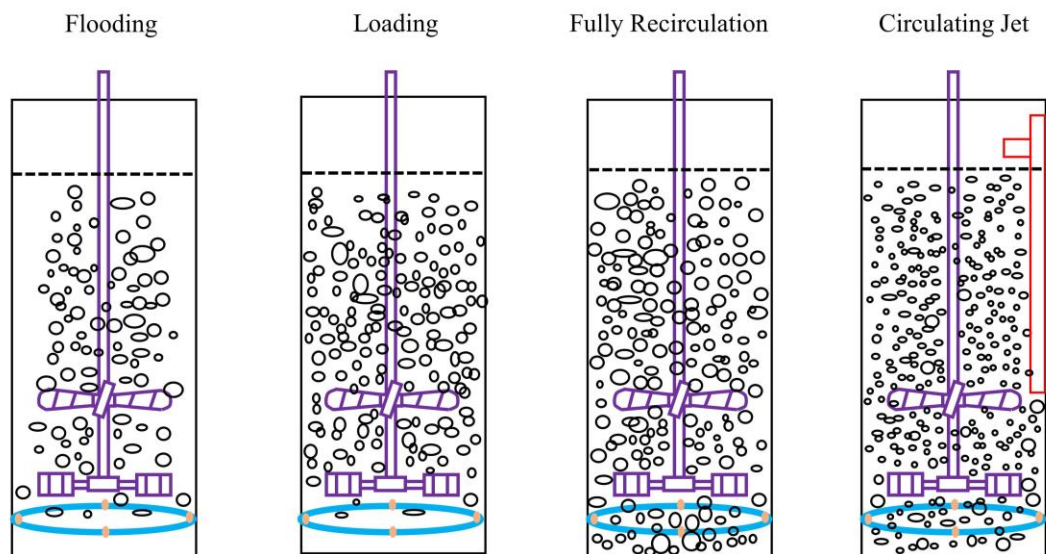


(a). Top view

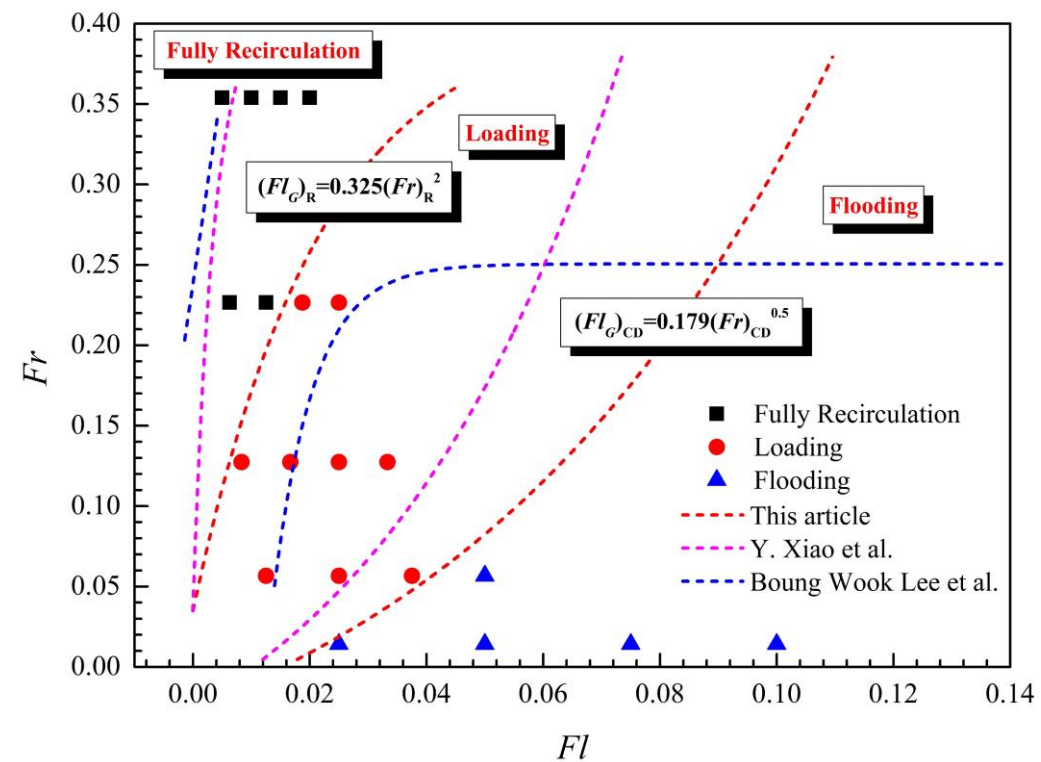


(b). Longitudinal section

Figure 4. Distribution of observation points

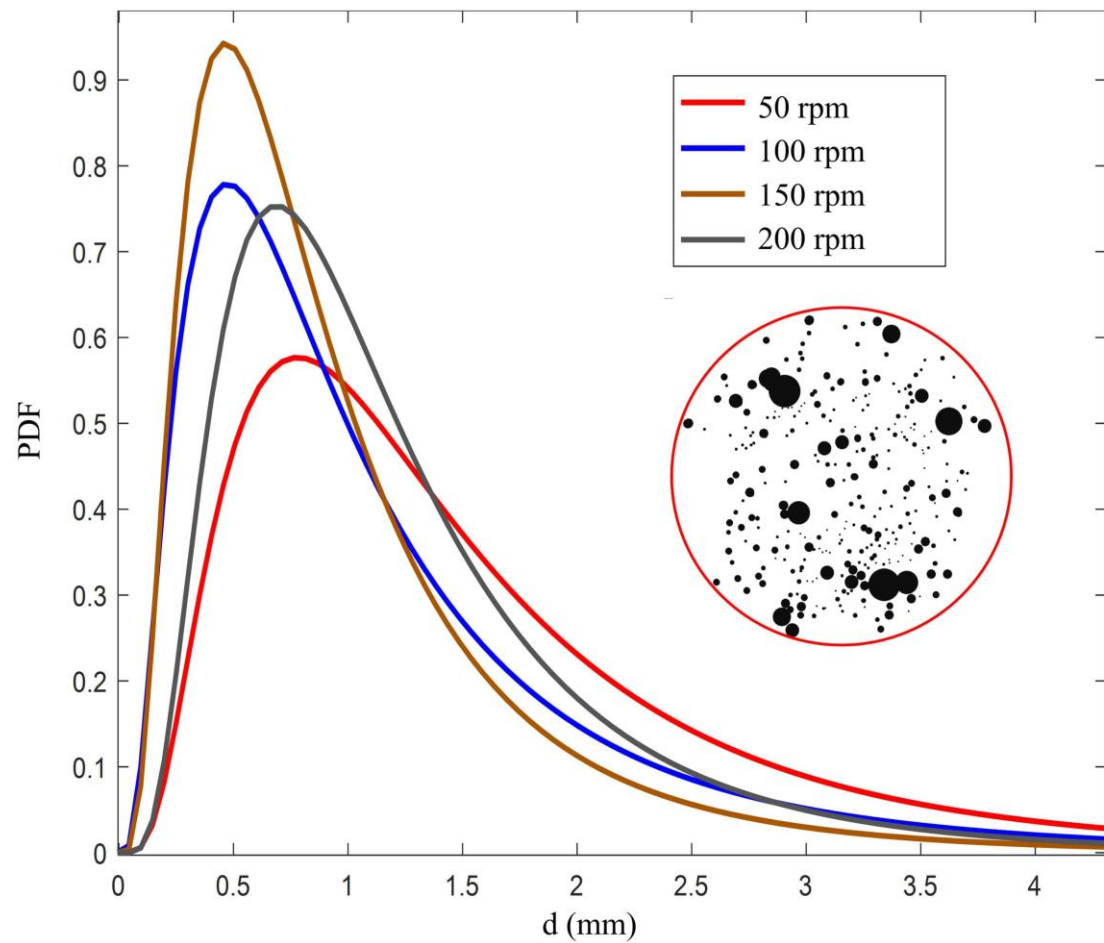


(a) Theoretical distribution diagram of different bubble flow regimes

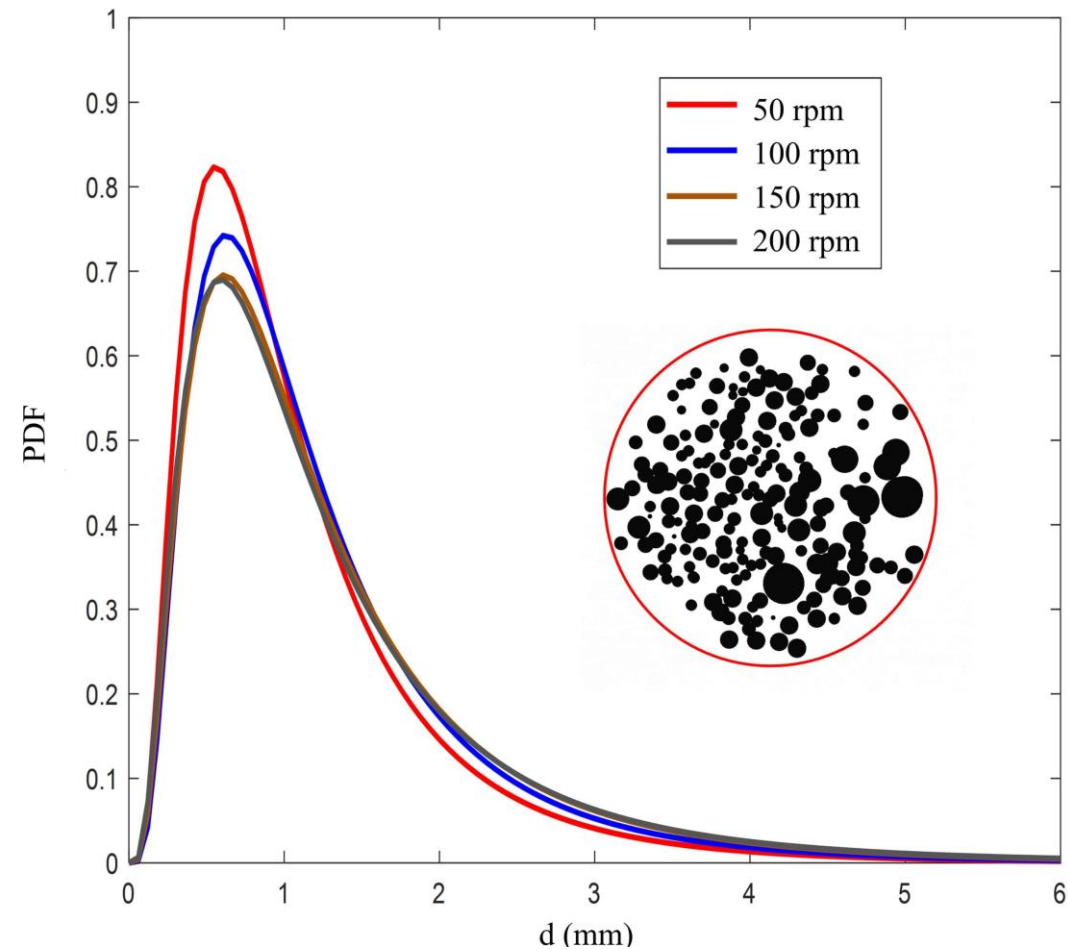


(b) Transition curve of the distribution of bubble flow regimes

Figure 5. Distribution of different bubble flow regimes and transition curves



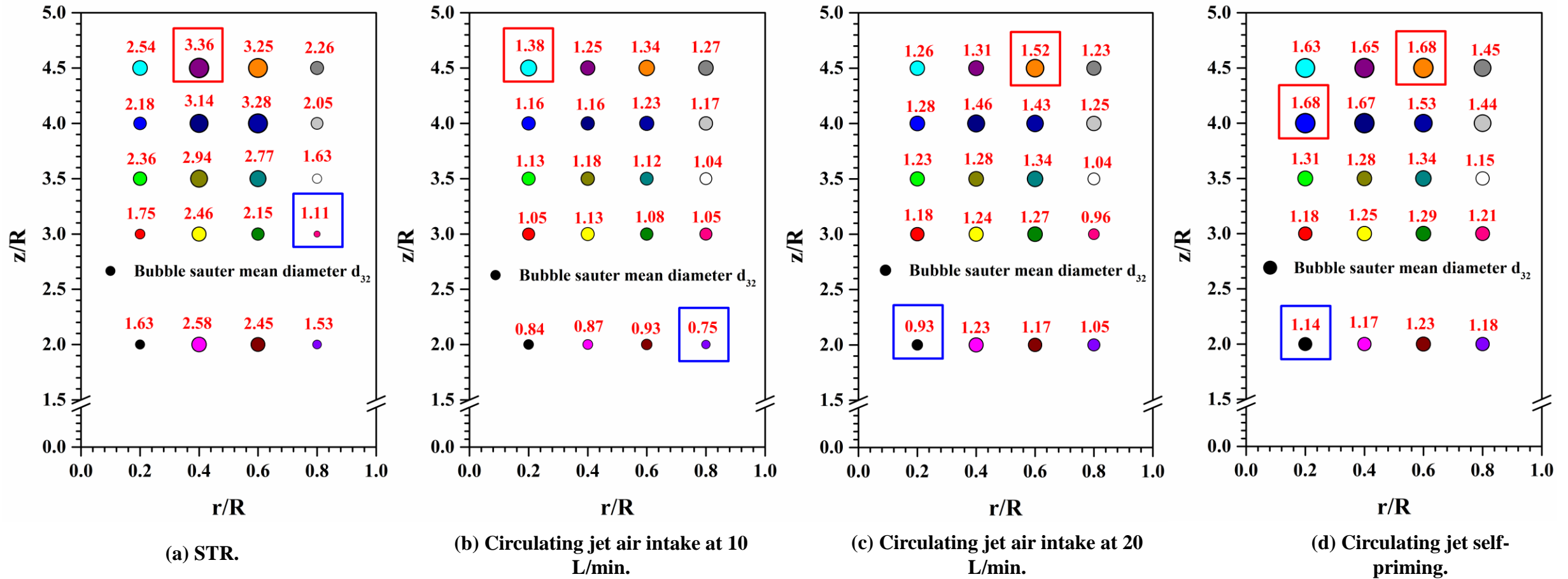
(a) Without circulating jet



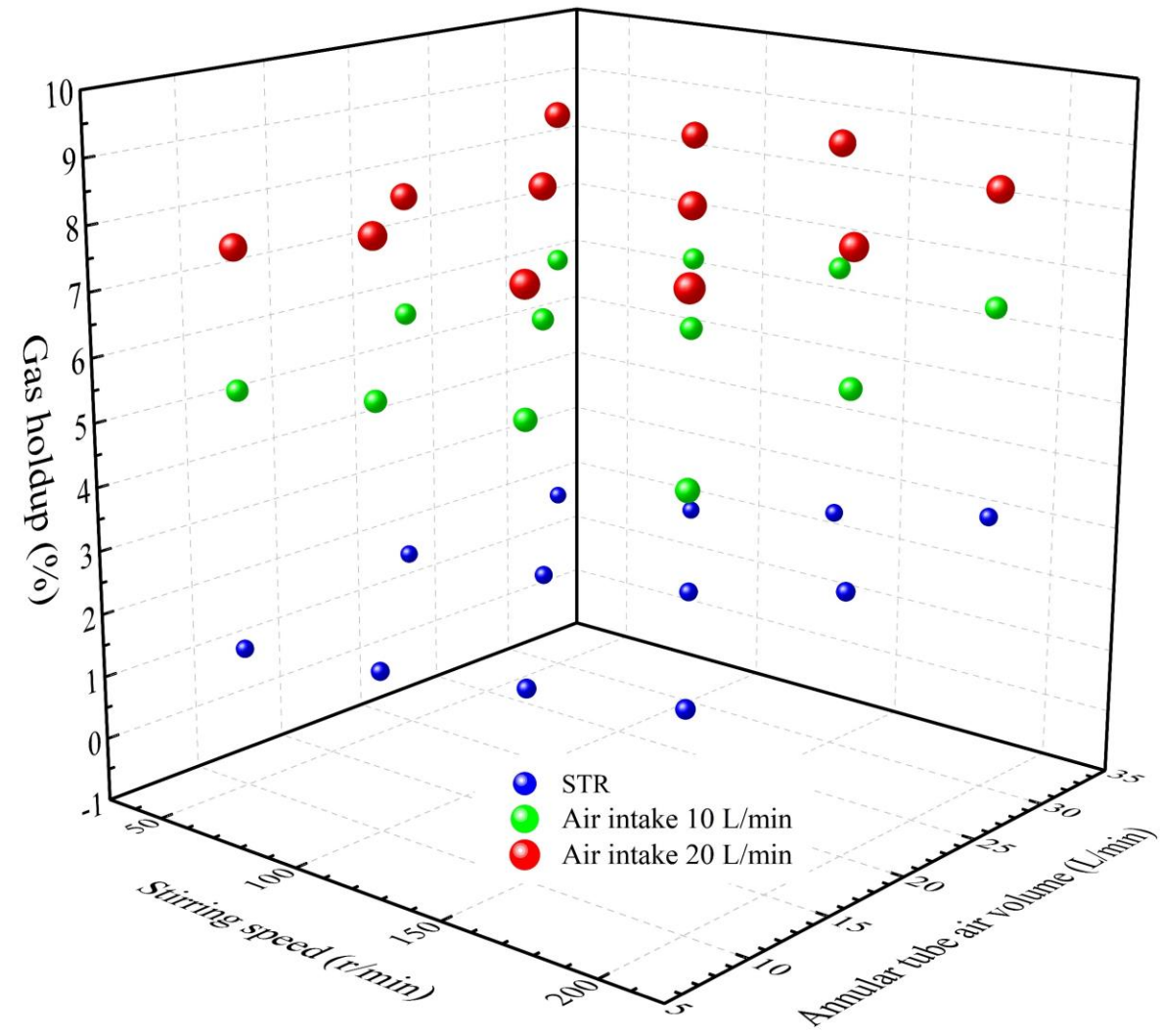
(b) With circulating jet

**Figure 6. BSD under different working conditions (annular tube air volume: 20 L/min; jet air intake volume: 10 L/min;  $z/R=4$ ;  $r/R=0.6$ )**



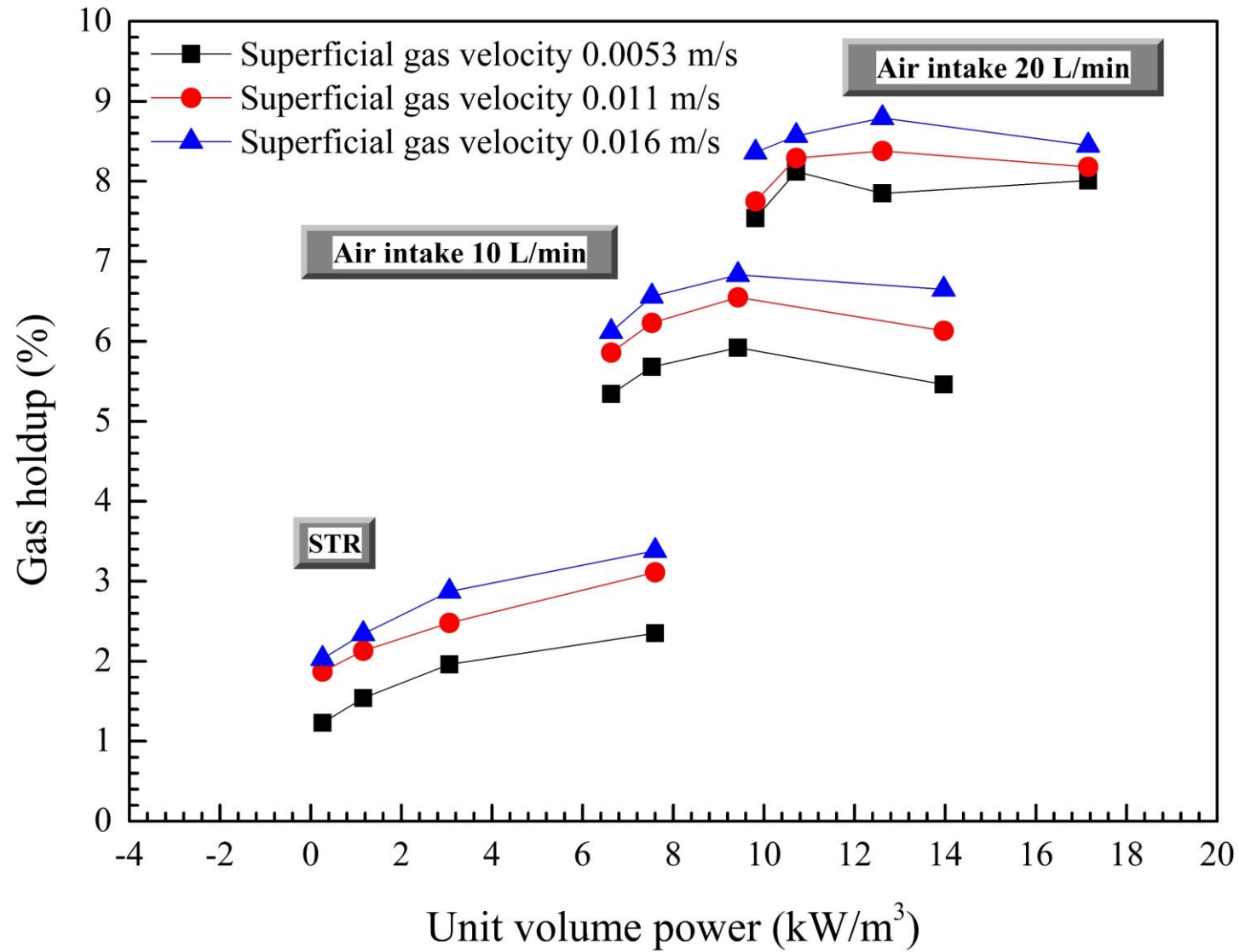


**Figure 7. Bubble Sauter mean diameter before and after adding a circulating jet (Stirring speed at 100rpm and annular tube air volume at 30 L/min)**

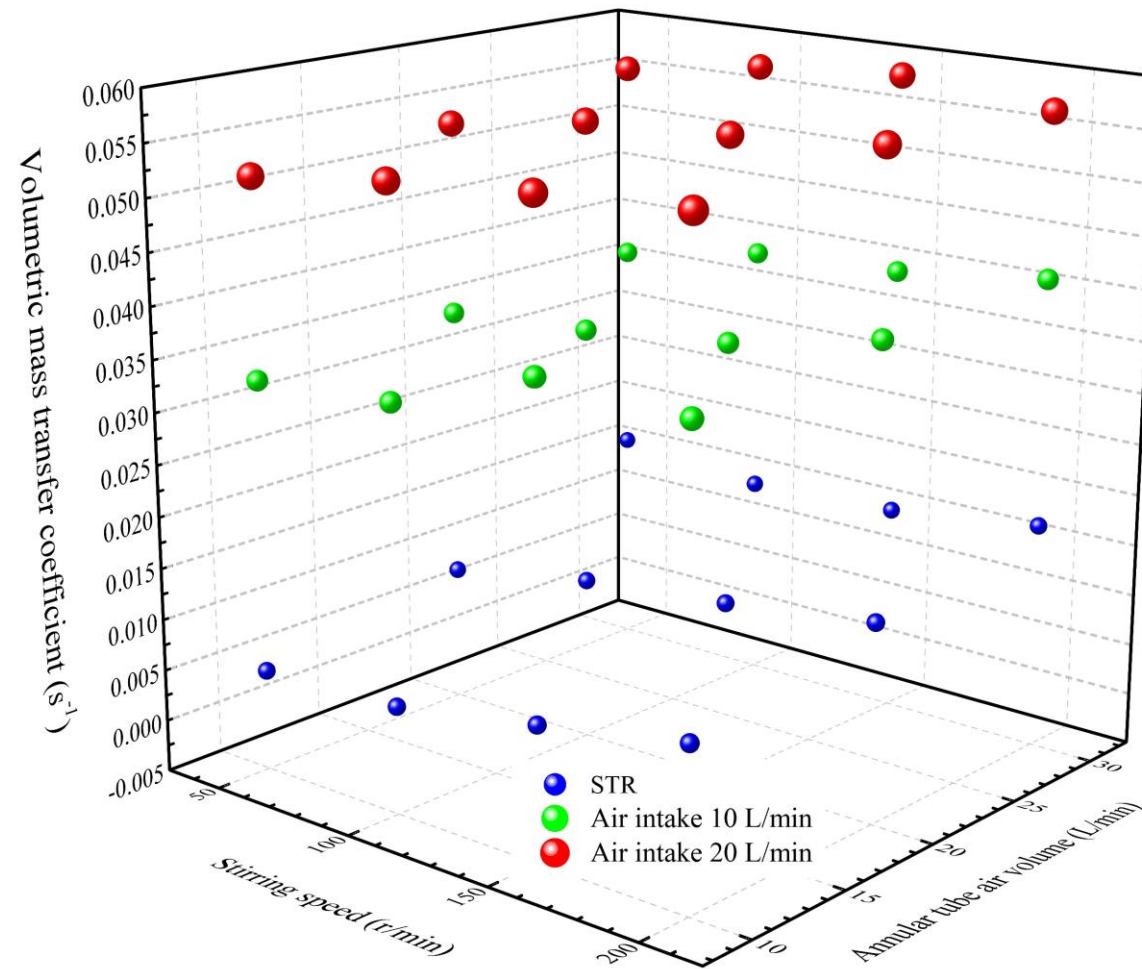


**Figure 8.** Change in the overall gas holdup of the reactor before and after adding a circulating jet





**Figure 9. Relationship between the overall gas holdup of the reactor with the unit volume power and superficial gas velocity before and after increasing the circulating jet**



**Figure 10.** Change in volumetric mass transfer coefficient  $k_L$  before and after adding a circulating jet

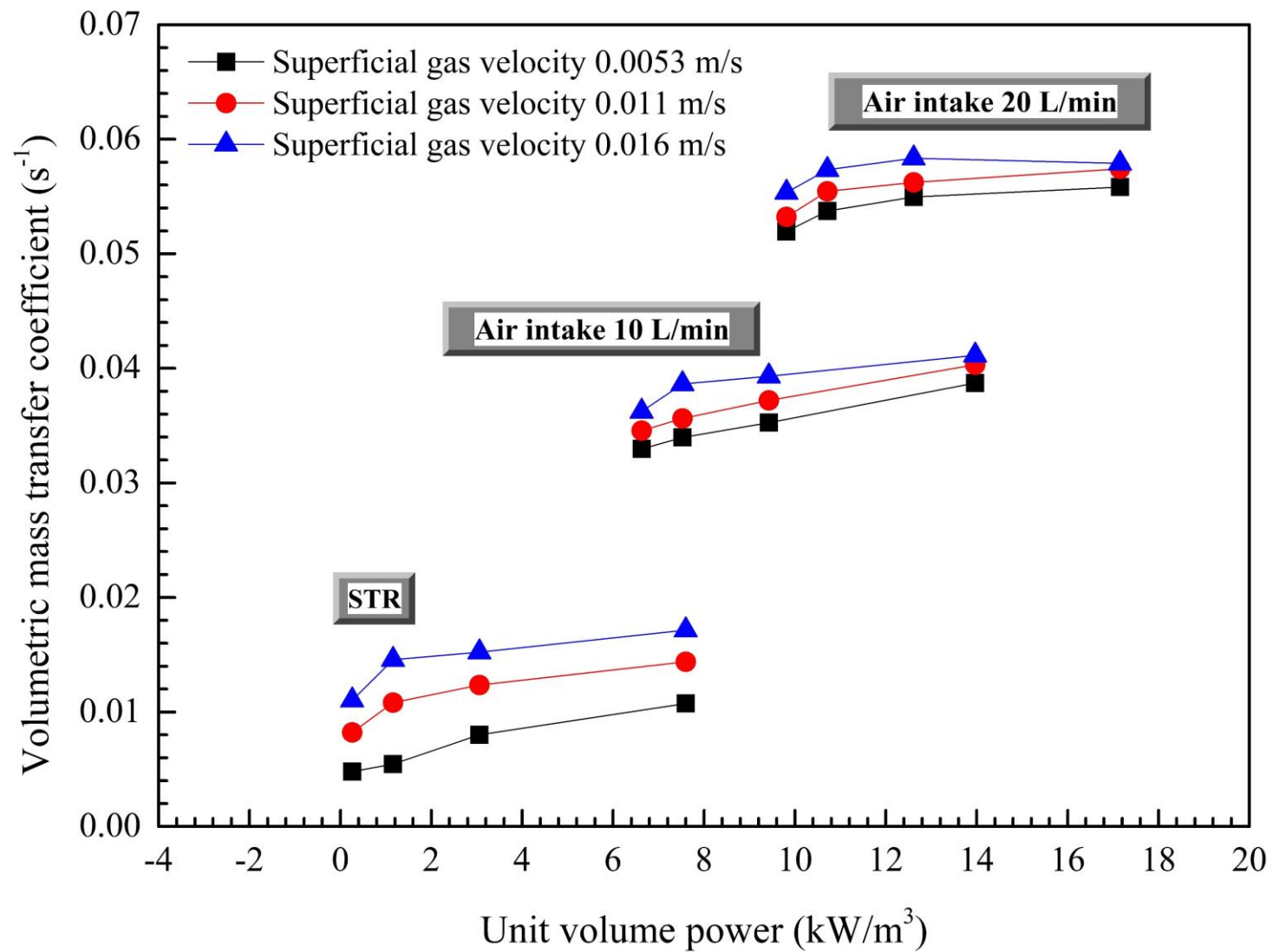
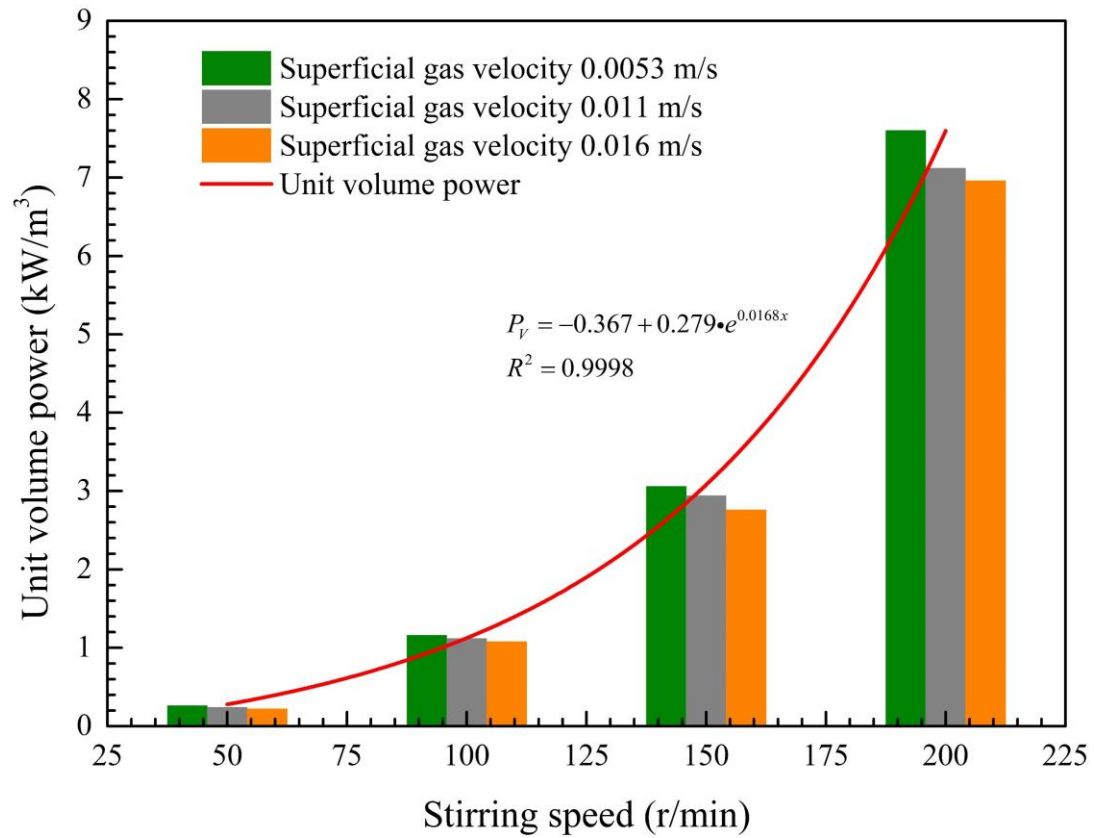
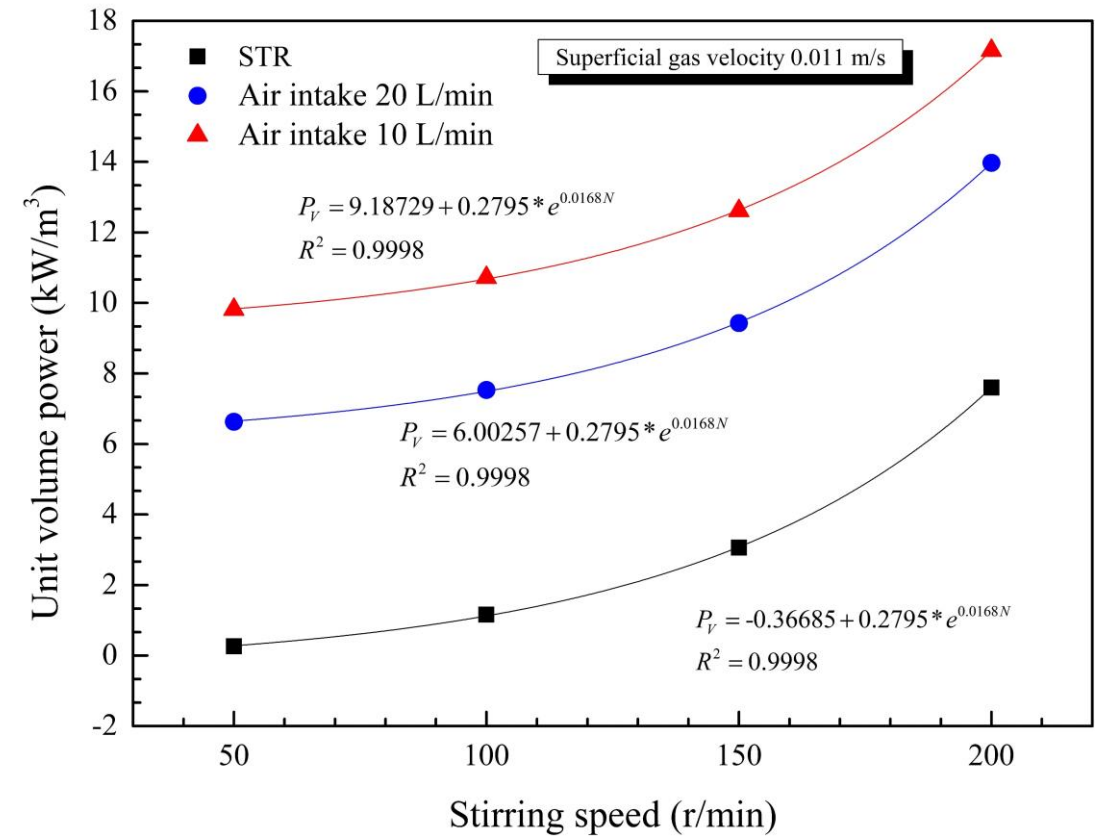


Figure 11. Relationship between volumetric mass transfer coefficient and unit volume power/superficial gas velocity

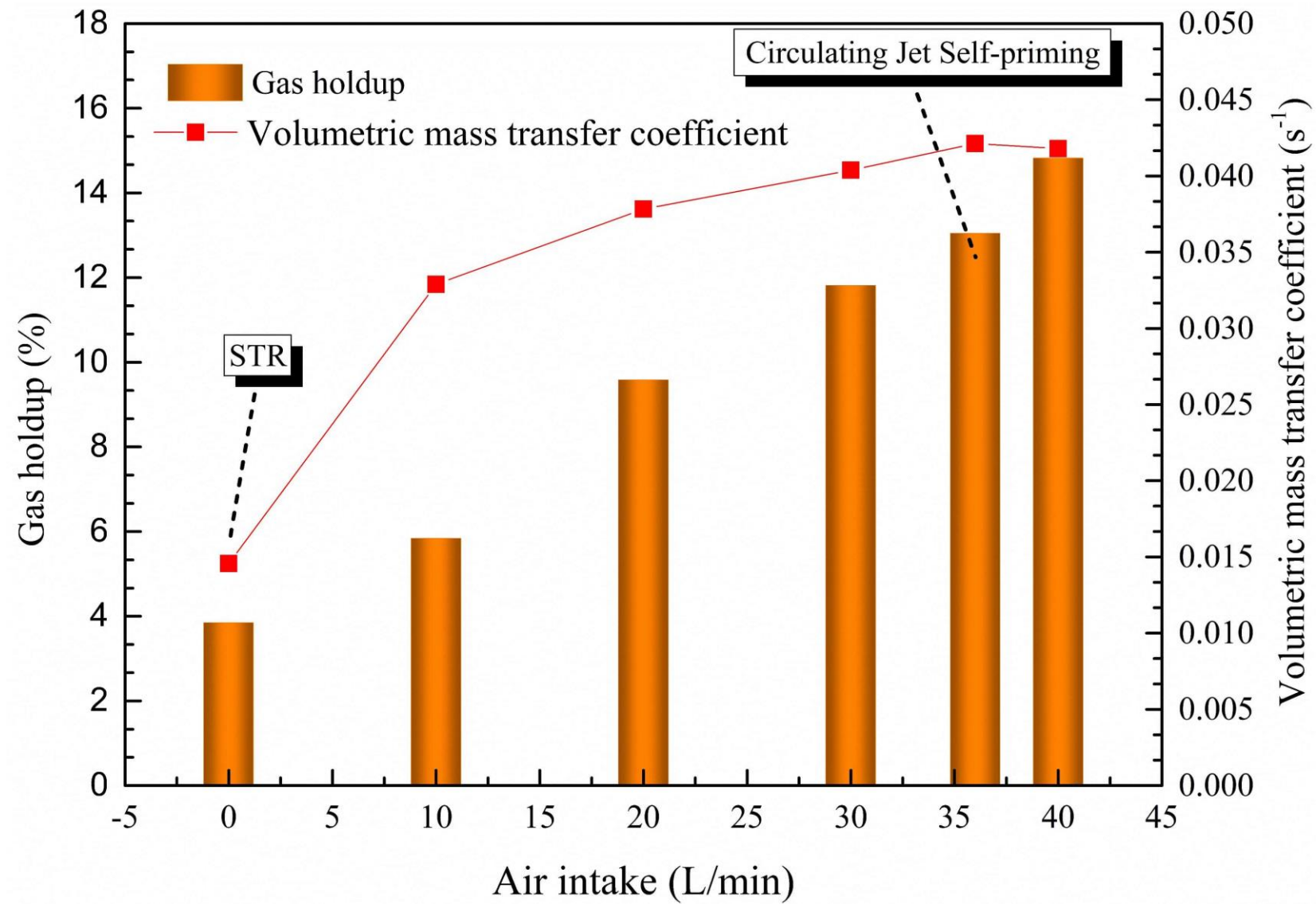


(a). STR.

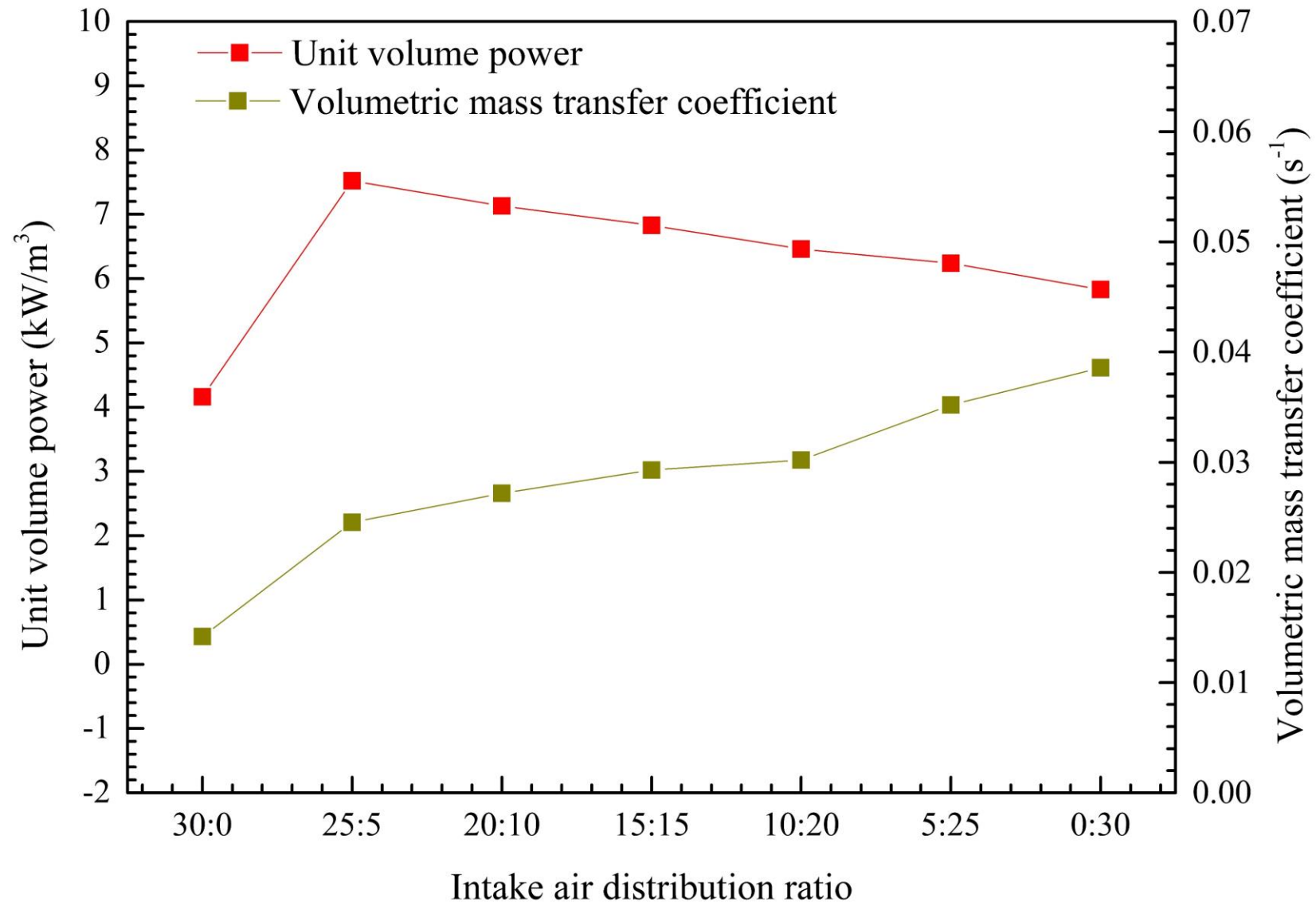


(b). Before and after adding a circulating jet.

Figure 12. Relationship between unit volume power and stirring speed

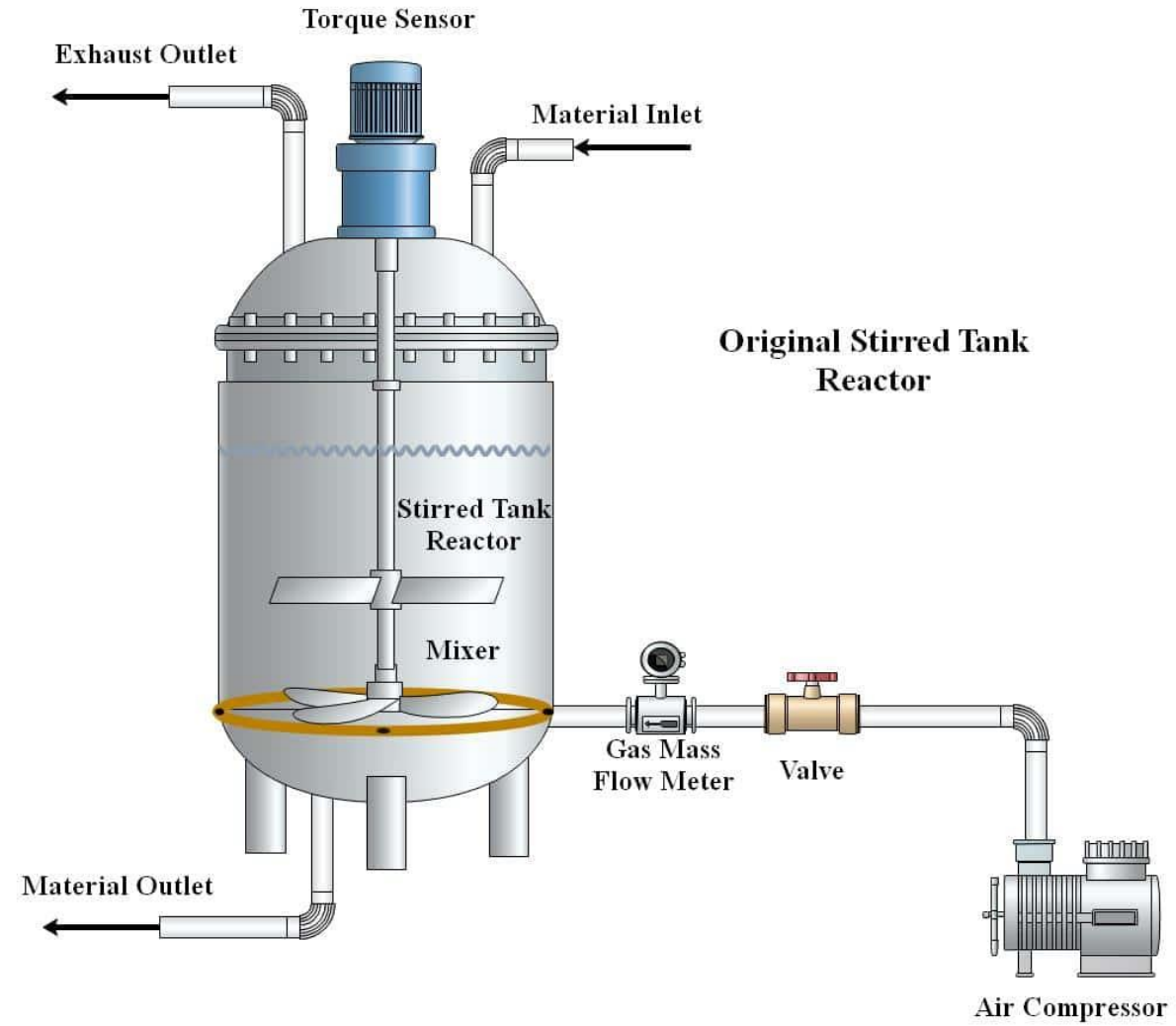


**Figure 13. Effect of adding a circulating jet on the overall gas holdup and volumetric mass transfer coefficient**



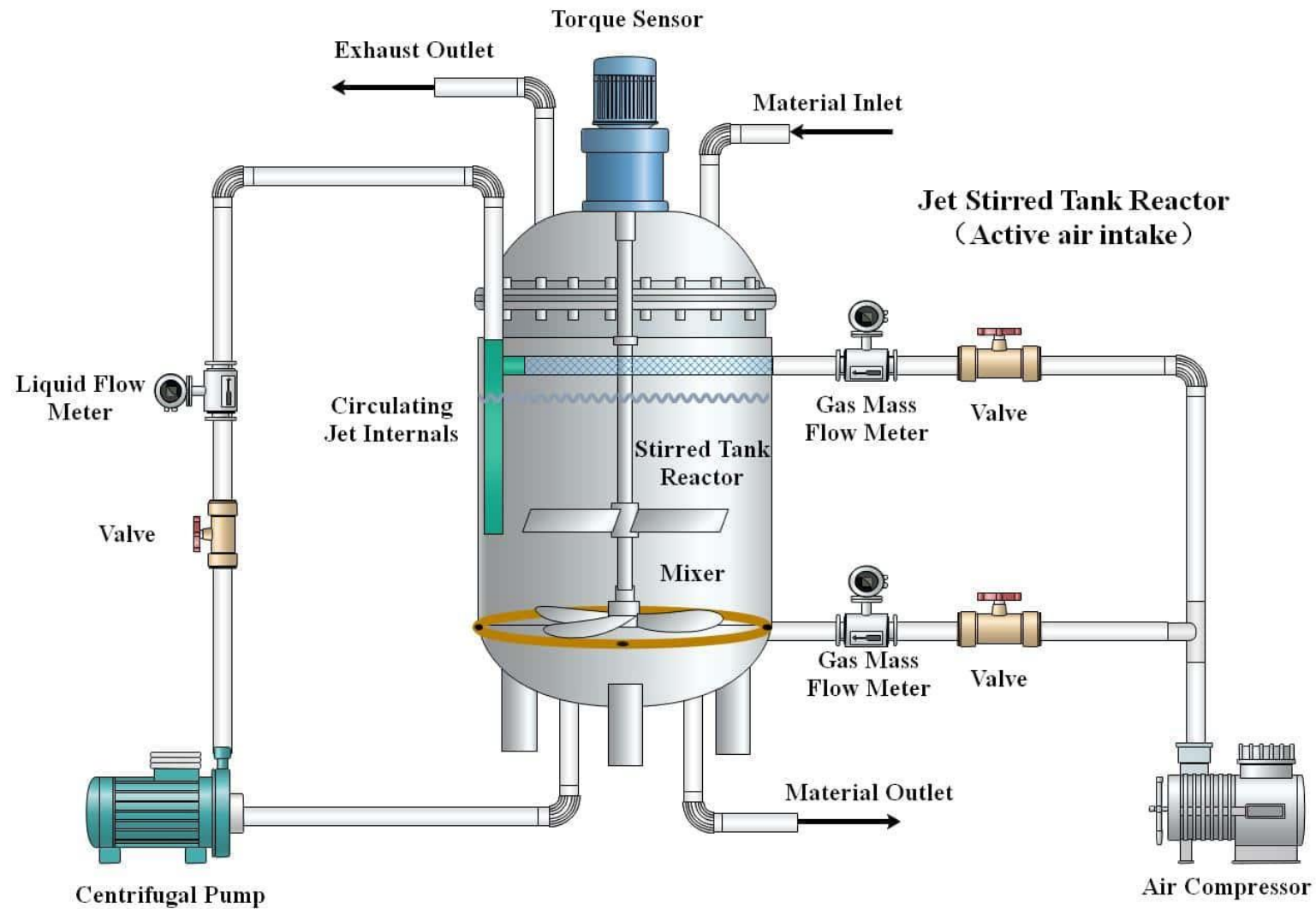
**Figure 14. Influences of different distribution ratios on unit volume power and mass transfer coefficient (with a stirring speed at 100 rpm)**





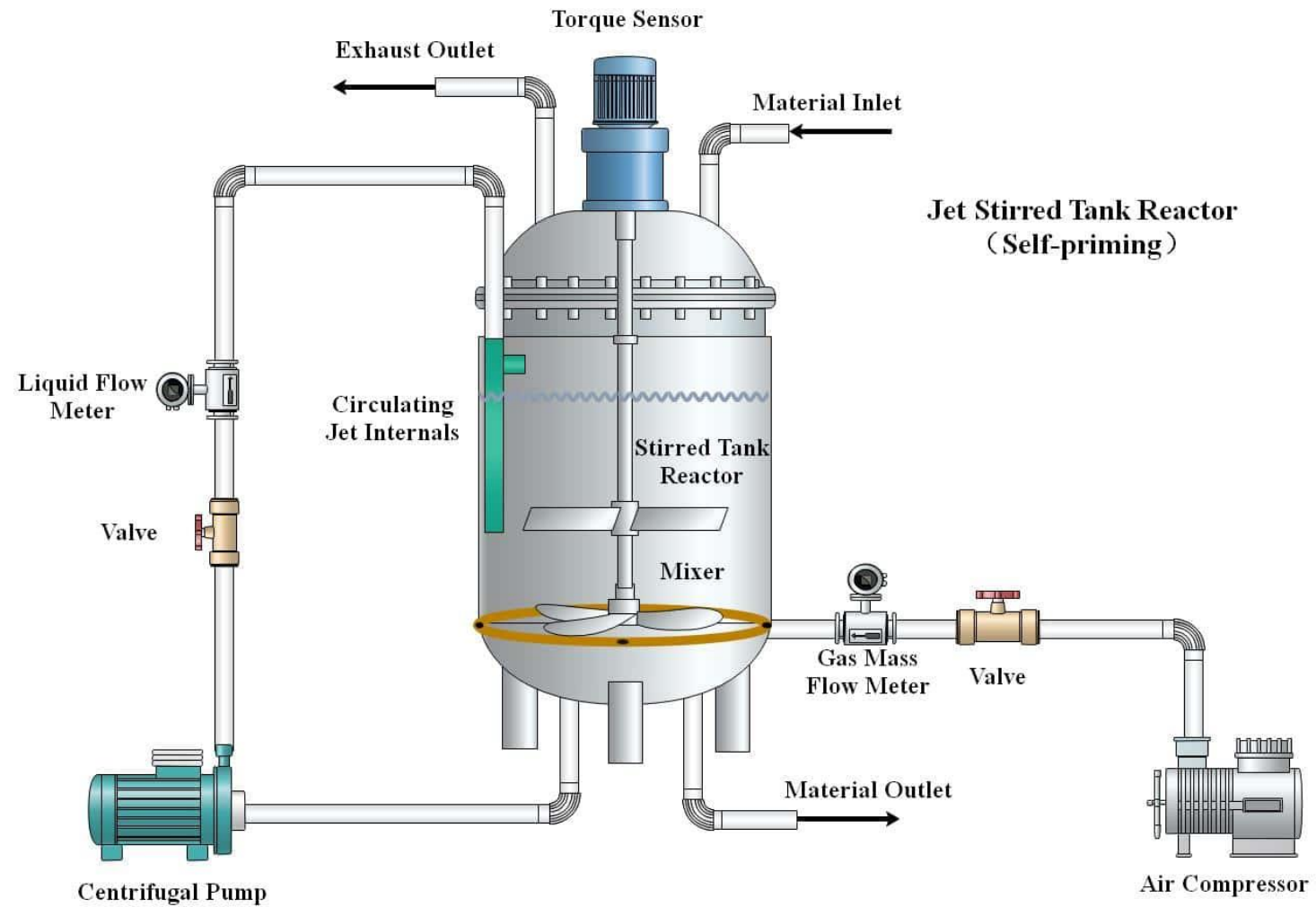
(a). Original Stirred Tank Reactor

**Figure 15. Industrial Application Prospect of Jet Stirred Tank Reactor**



(b). Jet Stirred Tank Reactor (Active air intake)

**Figure 15. Industrial Application Prospect of Jet Stirred Tank Reactor**



(c). Jet Stirred Tank Reactor (Self-priming)

**Figure 15. Industrial Application Prospect of Jet Stirred Tank Reactor**