

PA03 Relationship between Power Number Diagram and Mixing Process

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The power number diagram with Reynolds number (N_p-Re diagram) is required, when stirred vessels are designed or operated. It is well known that the isolated zone like doughnut ring for laminar mixing or the cylindrically rotating zone for turbulent mixing in an unbaffled vessel is generated. However it is not unexpectedly known in which Reynolds number does the isolated zone change from the doughnut ring to the cylindrically rotating zone. In this study, the mixing process of stirred vessel under the wide Reynolds number was visualized and the power number diagram with Reynolds number (N_p-Re diagram) related with the several kinds of isolated zone.

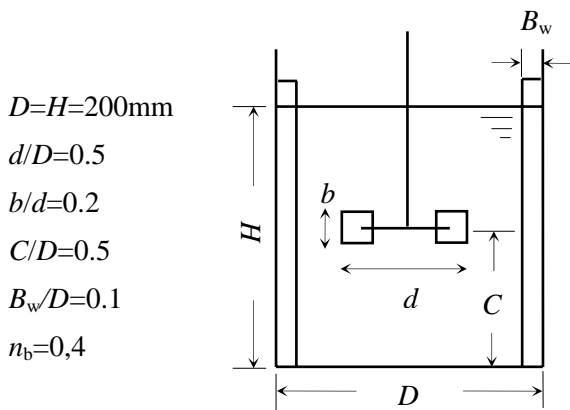


Figure 1 Schematic diagram of stirred vessel with Rushton turbine

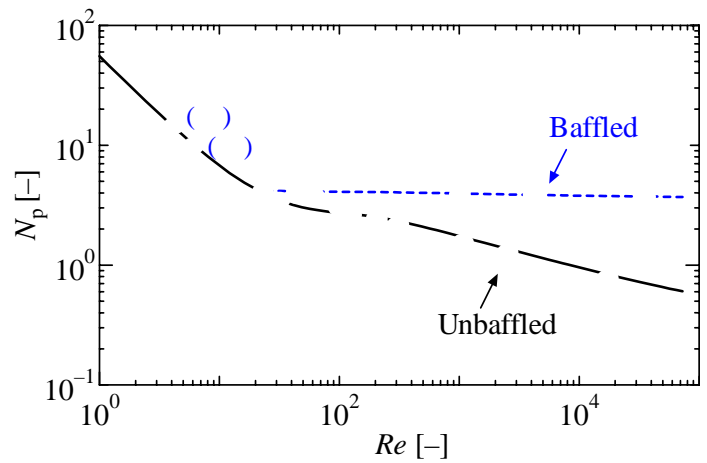


Figure 2 Power number diagram

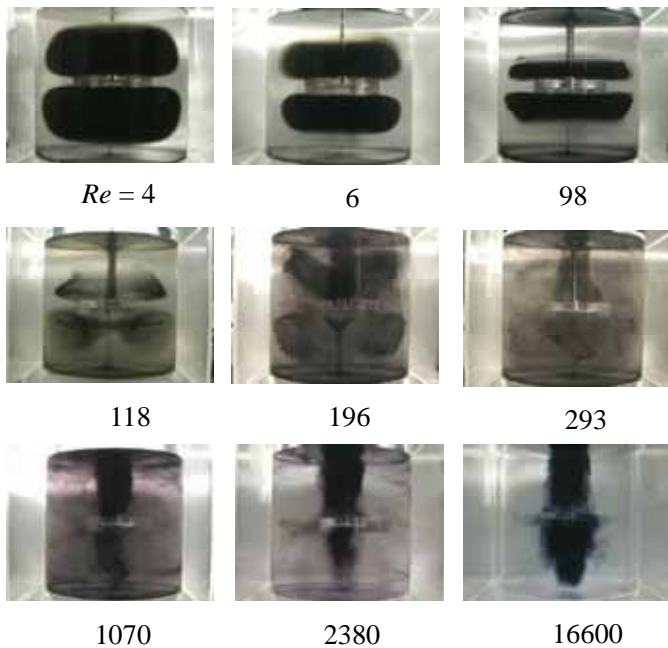


Figure 3 Mixing processes of unbaffled vessel.

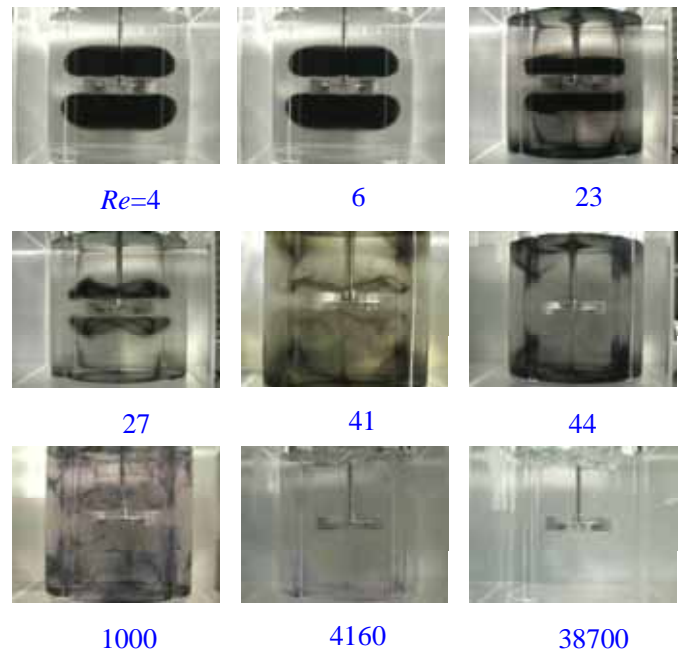


Figure 4 Mixing processes of baffled vessel.