

# Circulating Jet for Enhancing the Mass Transfer in a Gas-liquid Stirred Tank Reactor

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## Abstract

A gas-liquid stirred tank reactor (STR) has some problems, such as low mass transfer efficiency, high exhaust gas oxygen concentration, and low product conversion rate, due to limitations of stirring speed and input power. This article proposes a method to enhance the gas-liquid mass transfer in a STR using circulating jet internals. When a circulating jet is added, the average bubble size in the reactor is reduced to 1.26 mm, and the overall gas holdup is increased to 8.23%, which is an increase of 3.62 times of the original STR. The gas-liquid volumetric mass transfer coefficient is increased to 0.05556 s<sup>-1</sup>, which is 4.84 times of the original STR. The unit volume power is increased by only 1.4 times. These data provide references for the design and scale-up of new jet STRs.

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