

REVOLVING TRAY TOWER

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ABSTRACT

This work evaluates the estimation of parameters necessary for the design of gas liquid contact equipment namely revolving tray tower. Handling of slurries in conventional columns like packed or plate towers are always associated with complications of clogging, scaling, severe pressure drop or flooding inside the column. These problems necessitate the development of revolving tray tower.

The necessary parameters required for the design has been analyzed and a prototype was made in our laboratory. A three dimensional model was also developed. The first part of the paper deals with the design constrains and constructional details of the column. The tower differs from other conventional equipments in its ability to handle slurries effectively and to eliminate frothing or foaming during operation. To achieve this, the conventional tower design is modified to utilize centrifugal force in enhancing the slurry movement. Design allocations are also made to provide long gas liquid pathways and thin turbulent films of both phases inside the tower.

Two industrial case studies are also examined. This includes the recovery of ethanol from the clarifier sludge of molasses using steam as gas phase. The work was carried out by carefully controlling various parameters in an experimental setup developed in the lab. The second one is reduction of carbonic acid in mineral water plant using air as stripping gas phase. Further an effort has been made to peep into the gist of residence time distribution studies. The revolving tray tower requires an additional power consumption to provide centrifugal force, but its ability to capture delicate components and the subsequent production of superior product will make it economically feasible.