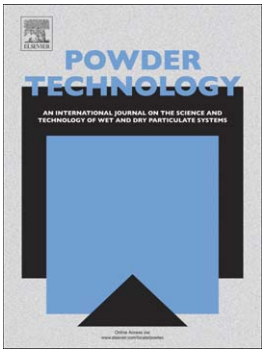

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AGGLOMERATE BEHAVIOR IN A RECIRCULATING FLUIDIZED BED WITH SHEDS: EFFECT OF BED PROPERTIES

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Abstract

The Radioactive Particle Tracking (RPT) technique was used to study agglomerates behavior inside a cold flow recirculating fluidized bed with internals (known as sheds), mimicking the stripper baffles of a Fluid Coker™. A higher fluidization gas velocity increases the time that agglomerates spend above the sheds and reduces the time spent in the shed zone and below the sheds, which is highly desirable. The residence time of the agglomerate in the stripper zone quadruples when the solid recirculation rate is cut by half. The release of vapors from agglomerates can be estimated by combining the RPT results with a coking reaction model. As the concentration of agglomerates inside the fluidized increases from 0 to 10 wt%, this study predicts wet agglomerates entering the stripper section with 30 wt% liquid would release 17% more hydrocarbon vapors below the top stripper shed.

1.0 Introduction

Fluid Coking™ (Figure 1) is a process used to upgrade heavy oils through thermal cracking. Oil is injected in a downward-flowing fluid bed of hot coke particles, where it heats up and cracks into smaller vapor molecules. The down-flowing coke particles are then conveyed to a fluid bed burner where they are reheated.