

ABSTRACT

CONTROL SYSTEM METHOD AND APPARATUS FOR CONTINUOUS LIQUID PHASE HYDROPROCESSING

A continuous liquid phase hydroprocessing process, apparatus and process control systems, where the need to circulate hydrogen gas through the catalyst is eliminated. By mixing and/or flashing the hydrogen and the oil to be treated in the presence of a solvent or diluent in which the hydrogen solubility is high relative to the oil feed, all of the hydrogen required in the hydroprocessing reactions may be available in solution. The oil/diluent/hydrogen solution can then be fed to a plug flow reactor packed with catalyst where the oil and hydrogen react. No additional hydrogen is required; therefore, the large trickle bed reactors can be replaced by much smaller tubular reactors. The amount of hydrogen added to the reactor can be used to control the liquid level in the reactor or the pressure in the reactor.

(FIG. 6)