

Abstract

Maleic Anhydride Hydrogenation Process and Succinic Acid Production Process Comprising the Same

The present invention relates to a process for producing succinic anhydride by maleic anhydride hydrogenation, comprising (1) feeding a maleic anhydride solution and a hydrogen raw material respectively to a first-stage hydrogenation reactor from an upper liquid-phase feed port and a top gas-phase feed port of the first-stage hydrogenation reactor for a first-stage hydrogenation reaction to obtain a first-stage hydrogenation product; (2) feeding the first-stage hydrogenation product to a second-stage hydrogenation reactor for a second-stage hydrogenation reaction to obtain a second-stage hydrogenation product, optionally, before entering the second-stage hydrogenation reactor, subjecting the first-stage hydrogenation product to a first-stage gas-liquid separation to obtain a first-stage gas phase and a first-stage liquid phase, and then feeding the first-stage gas phase and the first-stage liquid phase respectively from a top gas-phase feed port and an upper liquid-phase feed port of the second-stage hydrogenation reactor; and (3) subjecting the second-stage hydrogenation product to a second-stage gas-liquid separation to obtain a second-stage gas phase and a second-stage liquid phase, returning a part of the second-stage liquid phase to step (1) to be mixed with the maleic anhydride solution for the first-stage hydrogenation reaction, and optionally, using part or all of the second-stage gas phase as a circulating hydrogen. The present invention also relates to a process for producing succinic acid comprising such process, a liquid-phase hydrogenation reaction system, and a system for producing succinic acid comprising such system.

[Figure 2]