

Abstract

Process for producing lower olefins by using multiple reaction zones

The present invention provides a process for producing lower olefins by catalytic cracking a feedstock comprising an olefins-enriched mixture containing C4 or higher olefins and optionally an organic oxygenate compound. The technical problem mainly addressed in the present invention is to overcome the defects presented in the prior art including low yield and selectivity of lower olefins as the target products, and short regeneration period of catalyst. The present process, which is carried out under the conditions of catalytic cracking olefins and adopts as a feedstock an olefins-enriched mixture containing one or more C4 or higher olefins and optionally an organic oxygenate compound, comprises the steps of: a) letting the feedstock firstly enter a first reaction zone to contact with a first crystalline aluminosilicate catalyst having a $\text{SiO}_2/\text{Al}_2\text{O}_3$ molar ratio of at least 10, to thereby produce a first reaction effluent containing lower olefins; b) letting the first reaction effluent enter in turn at least one second reaction zone to contact with a second crystalline aluminosilicate catalyst having a $\text{SiO}_2/\text{Al}_2\text{O}_3$ molar ratio of at least 10, to thereby produce a second reaction effluent containing lower olefins; and c) separating lower olefins from the second reaction effluent; wherein the reaction temperatures in the first and second reaction zones are controlled. The present process, which desirably solves the above technical problem, can be used in industrial production of lower olefins.

No Figure