

ABSTRACT

Disclosed are a fluidized catalytic cracking reactor, a system and an application thereof. The fluidized catalytic cracking reactor comprises sequentially from bottom to top: a catalytic cracking reaction zone and an outlet zone, wherein the top end of the reaction zone is communicated with the bottom end of the outlet zone, wherein the reaction zone comprises at least one diameter contracting reaction section which has inner diameter continuously reduced from its bottom end to its top end, and has inner diameter at the top end which is greater than or equal to that of the outlet zone, and wherein the ratio of the total height of the at least one diameter contracting reaction section to the total height of the reactor is 0.15:1 to 0.8:1. By using the fluidized catalytic cracking reactor and system, it is possible to efficiently produce chemical raw materials such as ethylene and propylene from light petroleum hydrocarbons. When the reactor and system are used for catalytic cracking reactions, achieved are high contact efficiency between the feedstocks and the catalysts, good catalytic reaction selectivity, high yield for high value-added products such as ethylene and propylene, and low yield for by-products such as methane.

Fig. 1A