ABSTRACT

The present application discloses a circulating fluidized bed reaction regeneration device and its application method. The device comprises a fluidized bed reactor (1), a fluidized bed regenerator (2) and a riser reactor (3). The fluidized bed reactor (1) is used for introducing a naphtha feedstock and a methanol feedstock, wherein the naphtha feedstock is brought into contact with a catalyst from the riser reactor (3), so as to perform a reaction to generate a BTX-containing product gas flow and a spent catalyst, and the methanol feedstock undergoes a methylation reaction with benzene and toluene in the BTX-containing product gas flow to generate p-xylene; the product gas flow is subjected to gas-solid separation, the separated product gas is conveyed to a downstream section, unconverted naphtha is returned as a feedstock to the fluidized bed reactor, part of light alkanes is returned as a feedstock to the riser reactor (3), and the spent catalyst is introduced into the fluidized bed regenerator (2); and an inlet of the riser reactor (3) is connected to the fluidized bed regenerator (2), and an outlet of the riser reactor (3) is connected to the fluidized bed reactor (1). The method comprises: preparing an aromatic hydrocarbon by using the circulating fluidized bed reaction regeneration device and a metal molecular sieve bifunctional catalyst.

Fig. 1 for publication