Pattarawan Klomkom 2009: Performance of Polypropylene Cracking in a Fluidized Bed Reactor. Master of Engineering (Chemical Engineering), Major Field: Chemical Engineering, Department of Chemical Engineering. Thesis Advisor: Assistant Professor Sunun Limtrakul, D.Sc. 119 pages.

Operating conditions are essential for thermal cracking of polypropylene in a fluidized bed reactor under nitrogen atmosphere to obtain liquid fuels. The results show that the polypropylene feed rate, temperature, and nitrogen flow rate in the reactor have the effects on thermal cracking. The polypropylene pellets of 5 mm in diameter, with 50 grams of pellets were fed in a pause cycle. Appropriate reactor temperature was 450^{o}C in the main cracking zone of polypropylene pellet at the bottom of the reactor. The temperatures were decreased to 267, 275, 282^{o}C above the main reaction zone and were increased to 300, 450, 450^{o}C in the exit zone of the reactor for the systems operated with the nitrogen feed rates of 1, 1.3 and 1.5 times of the minimum fluidization velocity of plastic pellet, respectively. In order to maintain proper temperature, plastic can be fed with the flow rates of 10, 16.7, 25 g/min and the obtained liquid fuel yields were 40.37, 44.39, 47.99% for the systems operated with the nitrogen feed rates of 1, 1.3 and 1.5 times of the minimum fluidization velocity of plastic pellet, respectively. Increasing of gas velocity creates more fluidized bed expansion and reduces the cracking time. Thus the over cracking is reduced and gives more liquid yield..

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