Pyrolysis of rice straw using fluidized bed with char removal system

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Rice straw is one of the main renewable sources in Korea. In order to produce bio-oil from rice straw, a bench scale plant equipped with a fluidized-bed and a char removal system was applied. We investigated especially the influence of reaction temperature and the pretreatment of rice straw by washing with distilled water on the production of bio-oil and the efficiency of a char-seperating system. The effect of pretreatment of rice straw was also investigated by comparing the yield of bio-oil and the content of alkali metals in bio-oil from the experiments with unwashed rice straw with those with washed rice straw. Char removal system is composed of a cyclone and a hot filter. After every experiment, the particle distribution of each char and the content of solid in bio-oil was examined to demonstrate the efficiency of the char removal system. In the experiments, it was observed that the char removal system and the pretreatment reduced the content of alkali metals in bio-oil effectively, and the optimum reaction temperature range for the production of bio-oil was between 410-510 ℃. This subject is supported by the Ministry of Environment in Korea as "The Eco-technopia 21 project".