

Optimization of a fast pyrolysis system and deoxygenation for bio-oil production from agricultural by-products

이용희¹, 정대운^{1,2,†}

¹창원대학교 스마트환경에너지공학과; ²

창원대학교 토목환경화학융합공학부

(dwjeong@changwon.ac.kr[†])

A fast pyrolysis system was optimized to efficiently produce bio-oil with high heating value (HHV) from agricultural by-products. Various agricultural by-products were preliminarily screened via elemental and HHV analyses, leading to the selection of fruit tree waste as the feedstock because of its highest HHV. The bio-oil production was optimized at controlling gas velocity of 3.0 and reaction temperature of 500 °C because the heat transfer rate increased along with the gas velocity and the pyrolysis of organic matter accelerated as the temperature rose. Besides, the deoxygenation was performed, by using a CoMo catalyst, to increase the HHV of the produced bio-oil up to about 7,400 kcal/kg. This resulted from the reduction in the oxygen content by deoxygenation.

Acknowledgments:

This research was supported by the Korea Ministry of Environment as Waste to Energy-Recycling Human Resource Development Project (YL-WE-19-001).