Co-pyrolysis characteristics and kinetic analysis of organic food waste and plastic

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ABSTRACT: In this work, typical organic food waste (soybean protein (SP)) and typical chlorine enriched plastic waste (polyvinyl chloride (PVC)) were chosen as principal MSW components and their interaction during co-pyrolysis was investigated. Results indicate that the interaction accelerated the reaction during co-pyrolysis. The activation energies needed were 2-13% lower for the decomposition of mixture compared with linear calculation while the maximum reaction rates were 12~16% higher than calculation. In the fixed-bed experiments, interaction was observed to reduce the yield of tar by 2~69% and promote the yield of char by 13~39% compared with linear calculation. In addition, 2~6 times more heavy components and 61~93% less nitrogen-containing components were formed for tar derived from mixtures.

KEYWORDS: Co-pyrolysis, thermogravimetric analysis, kinetic, tar

1. Introduction

Abbreviations: SP, soybean protein; PVC, polyvinyl chloride; Exp., experimental; Cal., calculated.

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