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Co-Pyrolysis of LDPE and Cellulose: Synergies during devolatilization and condensation

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Highlights

- Synergistic effects were observed for co-pyrolysis of cellulose and LDPE
- The liquid yield and total energy recovery were increased by 14% and 15% respectively
- The synergies were evinced to happen both during devolatilization and condensation
- The sum of these synergisms was similar to the overall synergistic effect of co-pyrolysis

Abstract

The nature and mechanisms of synergistic effects observed during the co-pyrolysis of cellulose and low density polyethylene (LDPE), two major components in municipal solid wastes, were investigated at milligram and gram-scales. Pyrolysis of a mixture of LDPE and cellulose increased the yield of the liquid product, with an 83% increase in the energy recovery, compared to a mixture of the liquid products from pyrolysis of the individual components. Further experiments distinguished the synergistic effects during devolatilization and condensation, respectively. Synergism during devolatilization was investigated by mixing cellulose char

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