

**Investigation Into the Formation of Polycyclic Aromatic Hydrocarbons
from the Pyrolysis of Stigmasterol**

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Abstract

The purpose of this research is to obtain fundamental information on the pathways of formation of polycyclic aromatic hydrocarbons (PAHs) from the pyrolysis of biomass model compounds at short residence times. An understanding of these pathways could lead to a reduction in the PAHs produced from the thermal processing of biomass. We are currently interested in the formation of PAHs from the pyrolysis of plant steroids because the native ring structure appears to be predisposed to PAH formation by dehydrogenation reactions, and there is little information on PAH formation at short residence times (i.e., < 2 sec). Therefore, the formation of PAHs from the flow pyrolysis of stigmasterol was investigated as a function of reaction conditions (temperature, residence time, and concentration). It was discovered that the yield of PAHs increased with temperature (600EC, 700EC, and 800EC), residence time (100 - 1000ms) and concentration (0.9 - 70 mg/min). The reaction pathways for the formation of the primary products that lead to PAHs will be discussed.

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