

# FLASH VACUUM PYROLYSIS OF PLANT STEROIDS: THE IMPACT OF STEROID STRUCTURE ON THE FORMATION OF POLYCYCLIC AROMATIC HYDROCARBONS

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Utilization of biomass as a renewable source of energy is currently of interest as a consequence of the environmental benefits. However, the formation of polycyclic aromatic hydrocarbons (PAHs) from the pyrolysis and combustion of biomass is undesirable and poorly understood. We are currently interested in determining the chemical structures and mechanisms that lead to PAH formation in the pyrolysis of biomass model compounds at short residence times (< 1 sec.). This investigation focuses on whether the steroid ring structure can lead to PAHs. The unimolecular decomposition reactions were studied at low pressures using flash vacuum pyrolysis. It was found that the yield of PAHs, such as phenanthrene, anthracene, chrysene, benz[a]anthracene and their methylated derivatives, formed from the FVP of stigmaterol, stigmaterol acetate,  $\beta$ -sitosterol, cholesterol, cholesteryl acetate, dihydrocholesterol, and ergosterol at 700°C were dependent upon the ring structure of the steroid. The significance of these structural variations that lead to PAH formation will be discussed.

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