



Pyrolysis of Tobacco in Air

Application Note

Tobacco

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When tobacco burns, the products include a wide range of compounds, some of which are pyrolysis products, some have been oxygenated, and some just desorbed. This may be studied analytically by pyrolyzing the tobacco in air, collecting the pyrolysate onto a trap and then desorbing the trap to the GC/MS. As seen on the following page, the largest peak is nicotine, which is not a pyrolysis product, but is simply volatilized from the tobacco by heating. Some of the compounds are pyrolysis products of the cellulose, including furfural and methyl cyclopentenone. Aromatic hydrocarbons produced include toluene, xylene, naphthalene and many others, plus phenolic compounds including phenol and methyl phenol. Aliphatics, especially branched and unsaturated compounds are also generated, including limonene and long-chain alcohols.

Because the heating rate, temperature and time for pyrolysis with the CDS Pyroprobe are all selectable, experiments may be designed to simulate the various burning processes involved when tobacco is smoked. The air flow rate is also controllable, and is always vented and the trap flushed with Helium before it is placed on-line with the GC/MS.

Instrument Conditions

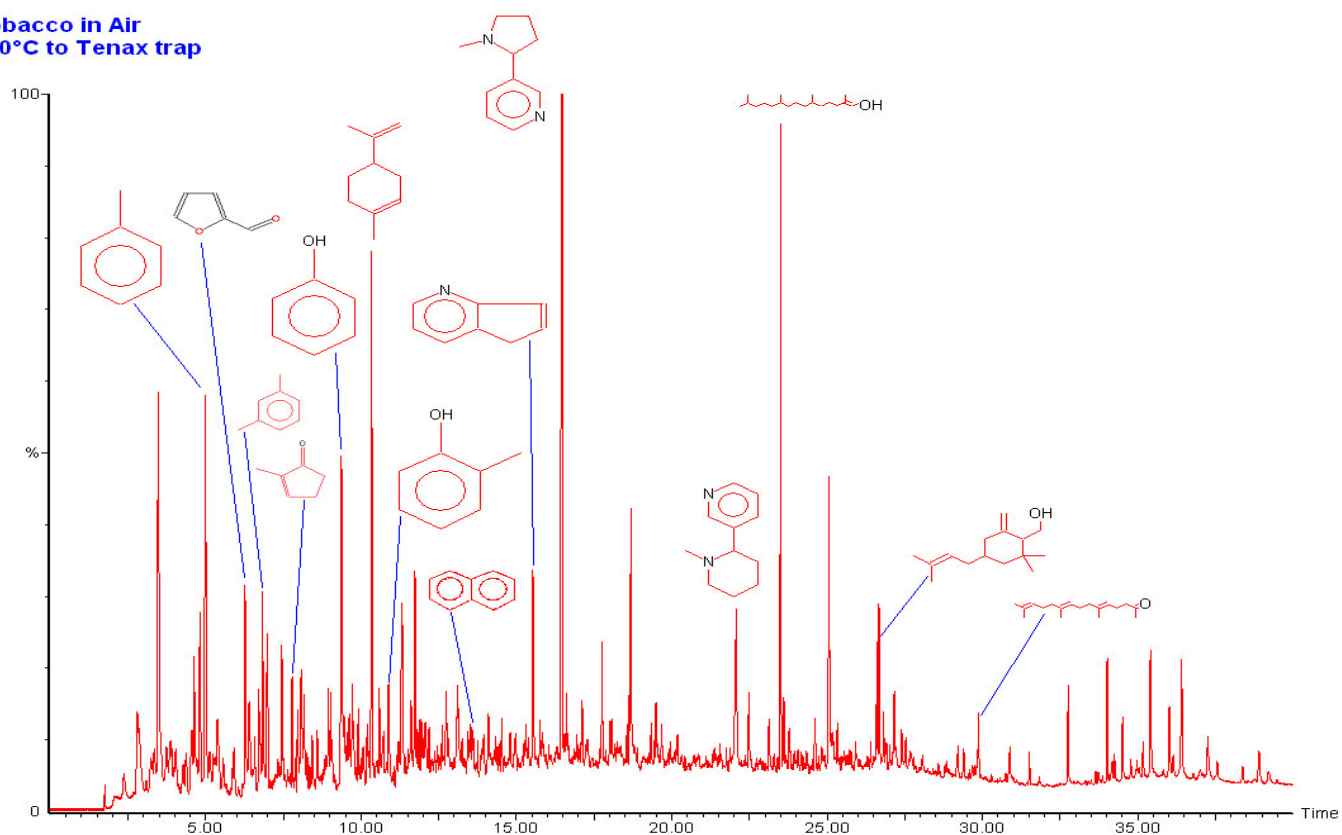
Pyroprobe

Interface:	300°C for 4 minutes
Pyrolysis:	800°C for 25 seconds
Valve oven:	325°C
Transfer line:	325°C
Trap rest:	40°C (Tenax)
Trap desorption:	325°C for 4 minutes
Reactant gas:	Air at 30 ml/minute

GC/MS

Column:	5% Phenyl methyl silicone 30m x 0.25 mm
Split:	50:1
Oven:	40°C for 2 minutes 8°C/minute to 300°C
Mass range:	35 to 600 AMU

**Tobacco in Air
800°C to Tenax trap**



FOR MORE INFORMATION CONCERNING THIS APPLICATION, WE RECOMMEND THE FOLLOWING READING:

Modeling of a smoldering cigarette, A. Rostami, J. Murthy, M. Hajaligol, J. Anal. Appl. Pyrolysis 66 (2003) 281-301.