



[ISO/TC 126/WG 10](#)
Intense smoking regime
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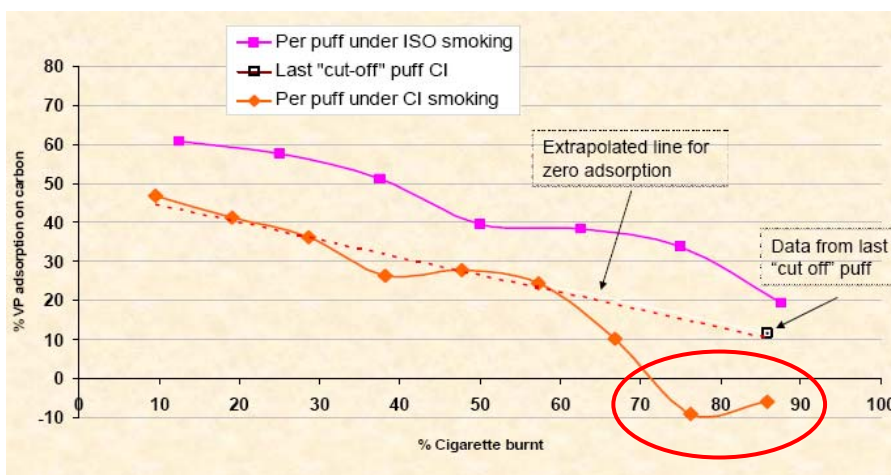
Charcoal filter desorption - Presentation S Colard

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Expected action	Info

Effect of smoking regime on Activated Carbon desorption

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Vapor Phase desorption

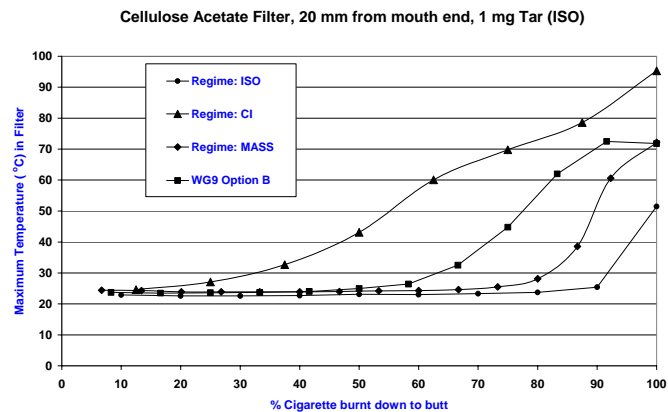


⇒ Carbon desorption in the later puffs

Ref.: 3rd WG10 meeting, Steve Purkis

Filter temperature profile

Temperature measurement demonstrate the elevated temperature of smoke passing through the filter during CI smoking compared to ISO smoking



⇒ Filter temperature responsible for carbon desorption?

Ref.: 4th WG10 meeting, Steve Purkis

Thermodesorption analysis Experimental design

1. Cigarette with filter containing Activated Carbon (50 mg) are mechanically smoked under ISO regime
2. After smoking, Activated Carbon has been transferred in a desorption tube.
3. This tube is heated, at different temperatures, to release trapped compounds
4. The released volatiles compounds are injected into a Gas Chromatography Mass Spectrometry (GC/MS)
5. GC/MS provides compounds identification and relative estimation

Experimental cigarette (ISO tar level: 10 mg) Activated carbon: 50 mg

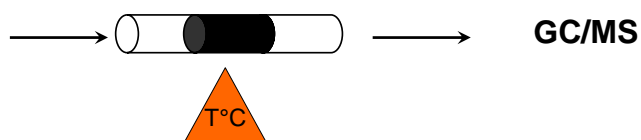
Filter CHARCOAL REMOVAL after smoking



THERMODESORPTION ANALYSIS

50°C and 70°C

Evaluation of charcoal desorption



Step 1 50°C, 60s

Step 2 70°C, 60s

Qualitative Analysis :

Identification of the compounds released first at 50°C and then those additionally released at 70°C.

Qualitative Results

Identification of some volatiles compounds released from activated carbon

compounds	Desorption 50°C	Desorption 70°C
Acetone	X	X
Crotonaldehyde	-	X
Methyl ethyl ketone	X	X
Acrylonitrile	X	X
Benzene	X	X
Toluene	X	X

Evaluation of charcoal desorption



Qualitative Analysis :

Identification of the compounds released first at 50°C and then those additionally desorbed at 70°C.

Step 1 50°C

Step 2 70°C

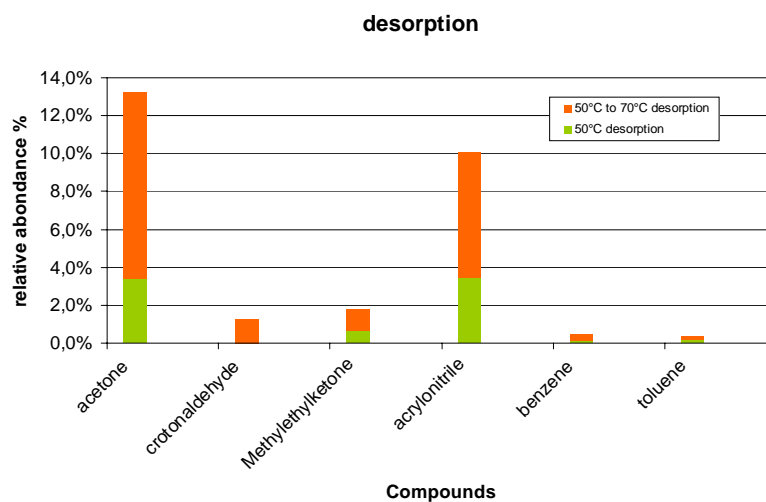
Step 3 320°C, 5 min

A third step has been added to the experiment at 320°C

The quantity of compounds released at this high temperature is considered as the reference (total desorption assumption)

The relative intensity of each compound previously identified is then estimated

Desorption estimation



Summary

- ✓ Some machine smoking regimes provoke high smoke temperature in the later puffs
- ✓ These high temperatures can induce desorption and then significantly increase the quantity of some volatile compounds in the vapour phase
- ✓ This phenomena should not be ignored

Thank you for your attention