

Gas Chromatography Olfactometry



This method combines the senses of trained panelists and the technology gas chromatography to establish the correlation between specific chemicals and the odour concentration. As the sample gas is passed through an olfactometer to be 'sniffed' by the panelist, it is also being analysed to identify the chemical compounds present. When the panelist senses an odour, she/he signals as such and the concentrations of compounds present are compared.

What is it?

Gas-chromatography-Olfactometry (GC-O) is a method to combine the information supplied by chemical characterization and by odour perception. GC-O utilises a GC-MS system equipped with an olfactory detection port: at the outlet of the GC there is a sniffer mask, where a trained panelist can smell the gas and provide information about the presence of odour in it. At the end of

the GC column, after separation of the chemical compounds in the gas mixture, the sample is divided and an equal flux of it reaches the MS detector and the panelist. The panelist sniffs the gas, and every time they sniff an odorous substance, they provide a sensorial response, in terms of presence and type of odour. Every time the panelist perceives an odour, they push a button and describe the odour. This way, an olfactogram is

obtained, which allows to correlate the chemical information supplied by the chromatogram and the sensorial perceptions of panelist.

GC-O consists in the combination of instrumental capacities and human nose and supplies both sensorial and chemical information.

One drawback of GC-O is that it is affected by subjectivity and inattention of the panelist. Indeed, panelist distraction can provoke important errors, in particular when odorous stimulus is short or weak.

What can it be used for?

GC-O can be used to provide important information about the odour character associated with the different molecules contained in an odour sample. Thus, it allows to obtain information about odour quality. This technique is particularly suited to the analysis of odours due to the use of human nose, which is way more sensitive than an instrumental detector: the human nose is sometimes able to detect the presence of odours also where the chromatogram doesn't show any peak.

What can it NOT be used for?

This technique doesn't provide any information about the odour concentration of the sample. Since it operates a separation of the sample in its single components, the olfactory properties of the sample as a whole are not considered. For this reason, data from GC-O analysis cannot provide information about the odour impact, and neither can it be used directly as input for dispersion modelling.

