

A study in Perfluorinated compounds using MS200 TOF Mass

Introduction:

Perfluorinated compounds (PFC) are widely used in semiconductor manufacture facility such as heat exchange fluid, cleaning agent...etc. People usually think the PFC is "safe" due to the inert chemical behavior. But the PFC will cause some problem when the facility is a 28nm process FAB or lower.

Objectives:

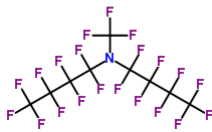
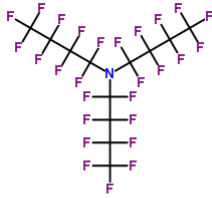
A high sensitivity portable device will be needed when monitor the PFC concentration or find out the leakage in semiconductor FAB.

KORE MS200 is a rigid device which is designed to perform quick response with high sensitive analysis in field.

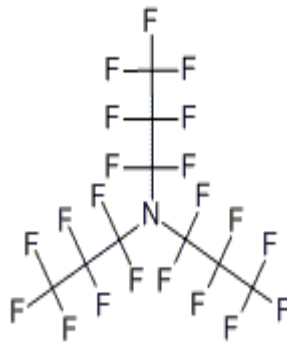
Experiment:

- Target compounds:

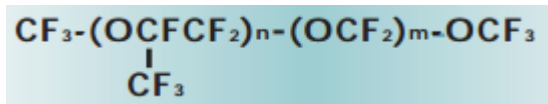
FC 40



FC 3283



HT series have similar structure (Ex. HT110, HT200)



- MS200 method setup:

Sampling time: 30 sec

Mass Range: 1-300amu

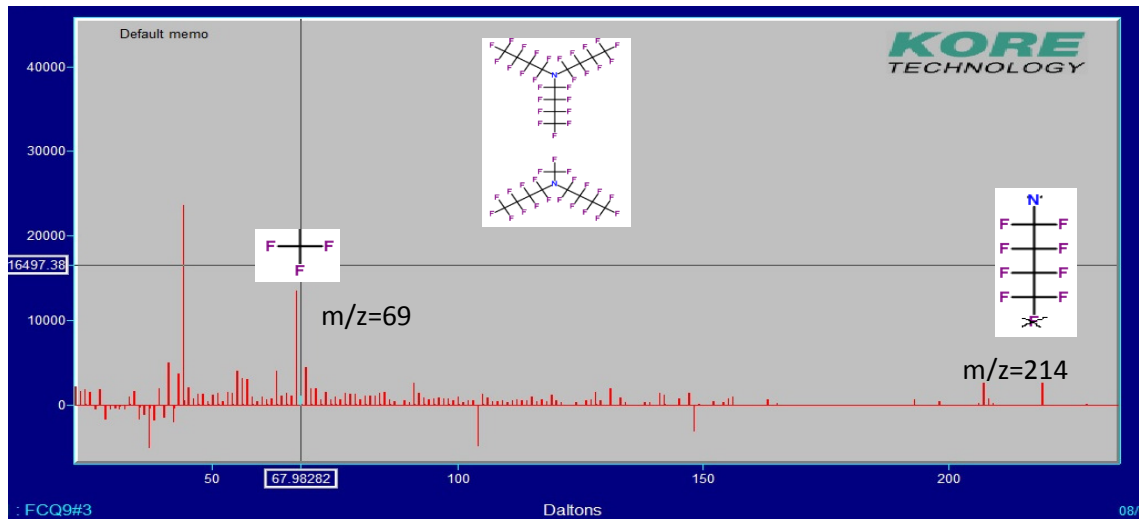
- Sample preparation

Vaporize the standard sample liquid then dilute with zero air to 30 ppb.

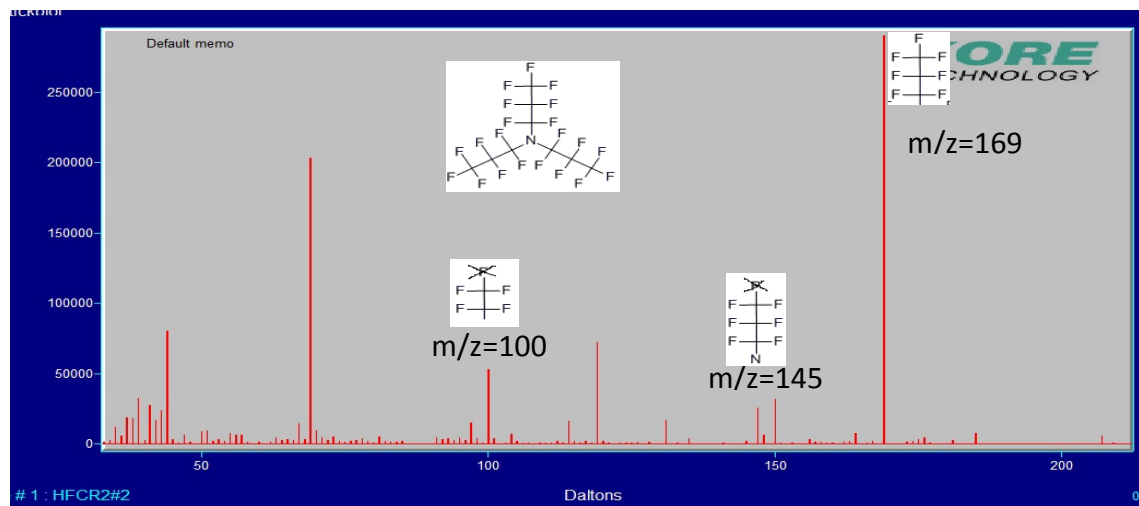


Data base setup:

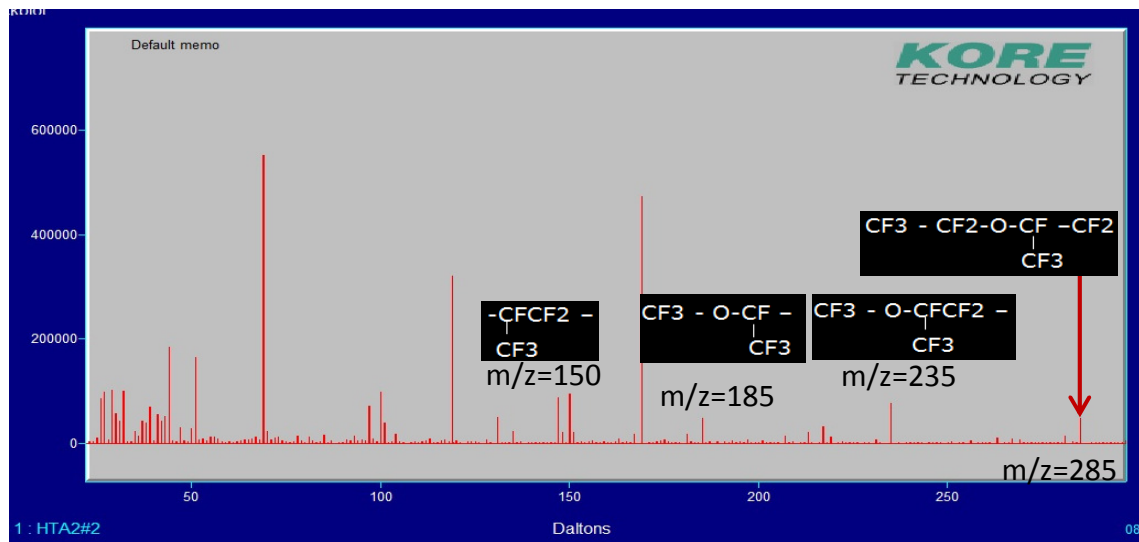
FC40



FC3283

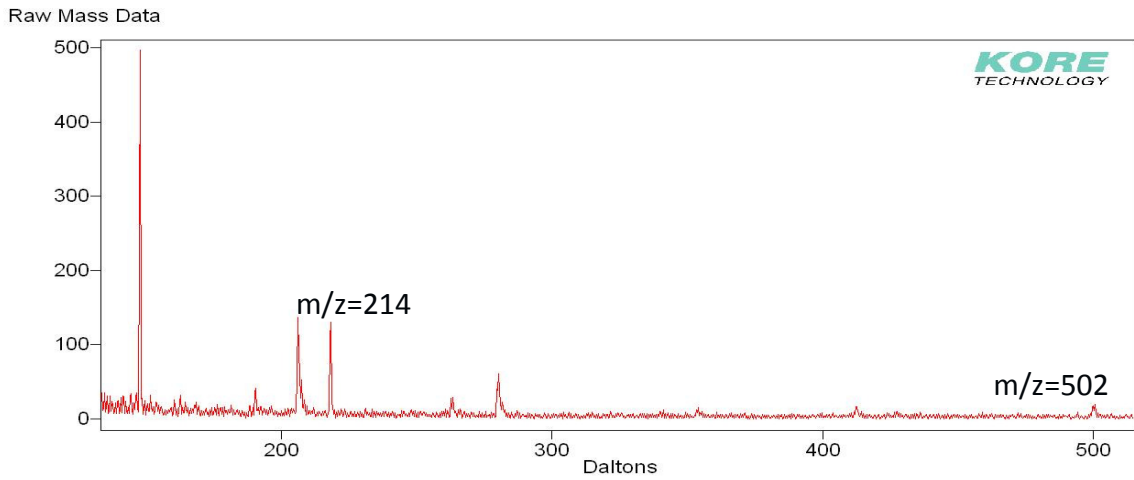


HT series



Sensitivity test:

Dilute a 600 ppb FC 40 gas sample to 600 ppt, we can still find the $m/z=214$ of FC40 significantly.



Real Sample in FAB

unit: ppb	site A	site B	site C	site C	site D	site E	site F	site G
HT series	18.4	11.3	10.2	11.6	30.6	15.9	22	16.3
FC3283	0	4	3.8	2.8	5.1	0	2	0
PFTBA	0	0	0	0	15.1	0	0	0
FC40	62.1	15.1	28.1	20.6	20.3	35.5	113	53.9
Total amount	80.5	30.4	42.1	35	71.1	51.4	137	70.2

Conclusion:

MS200 provide the outstanding performance in PFC and other VOCs monitoring . Without any gas cylinder needed gives an easy portable mass spectrometer to anywhere you want. The 30 seconds analysis time means we can get the really real time result.