THERMAL ANALYSIS OF SOLVATOMORPHIC DECAKIS(DIMETHYLAMMONIUM) DIHYDRODODECATUNGSTATE HYDRATES

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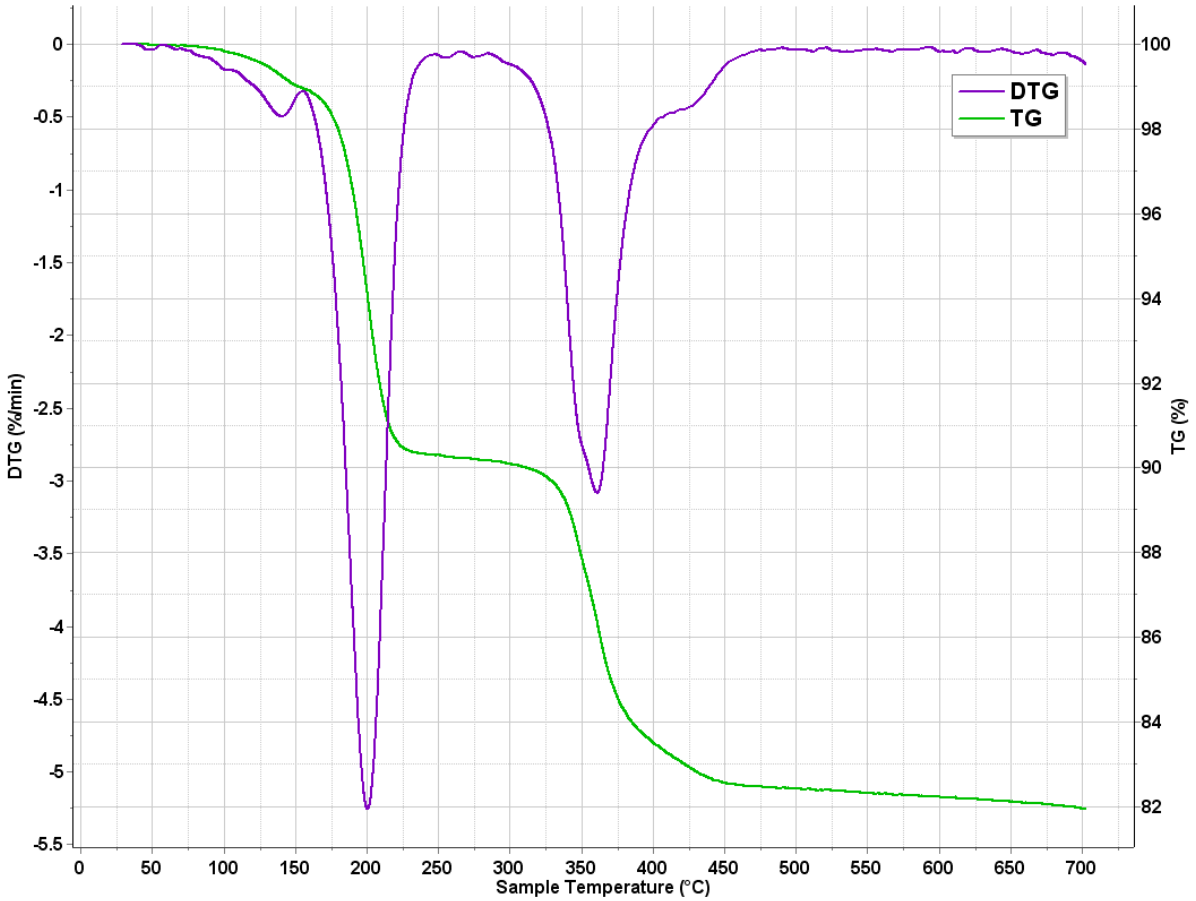
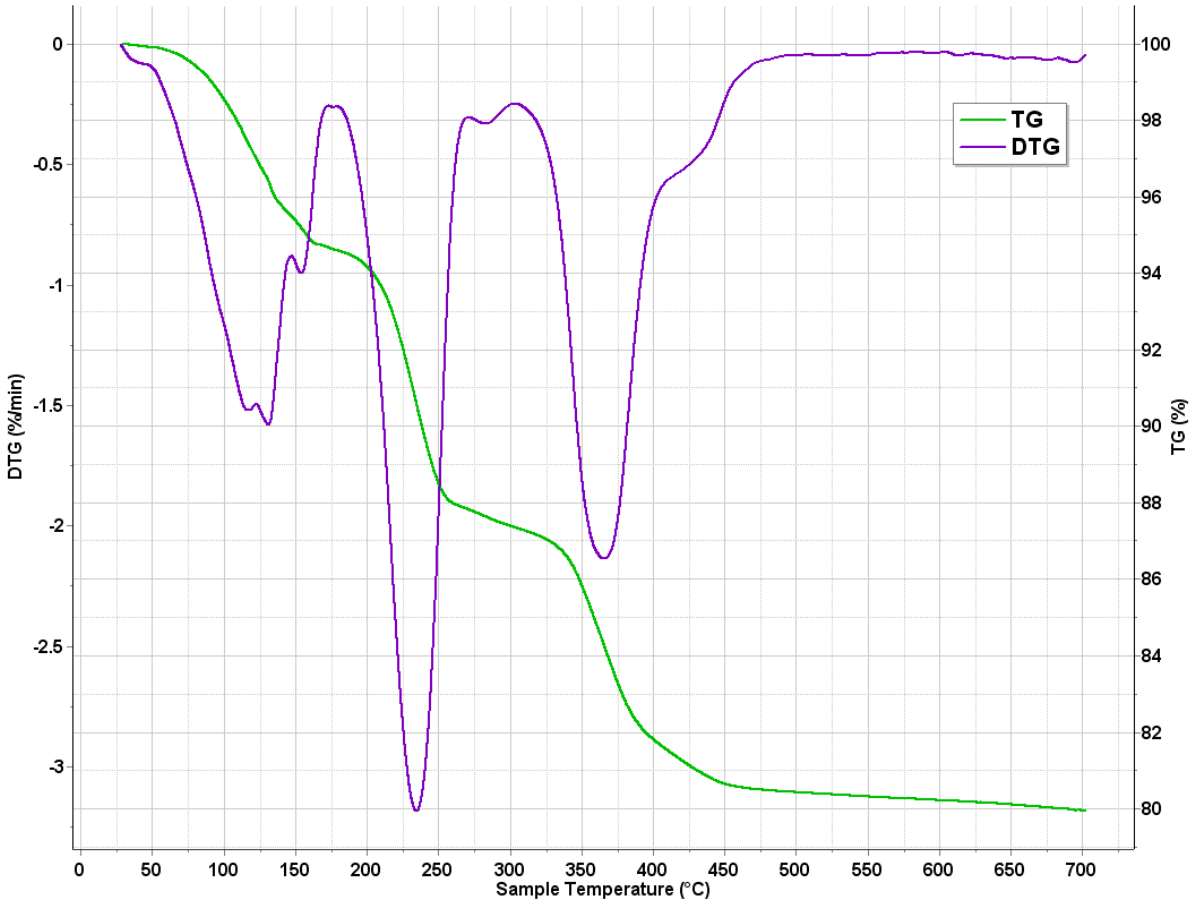


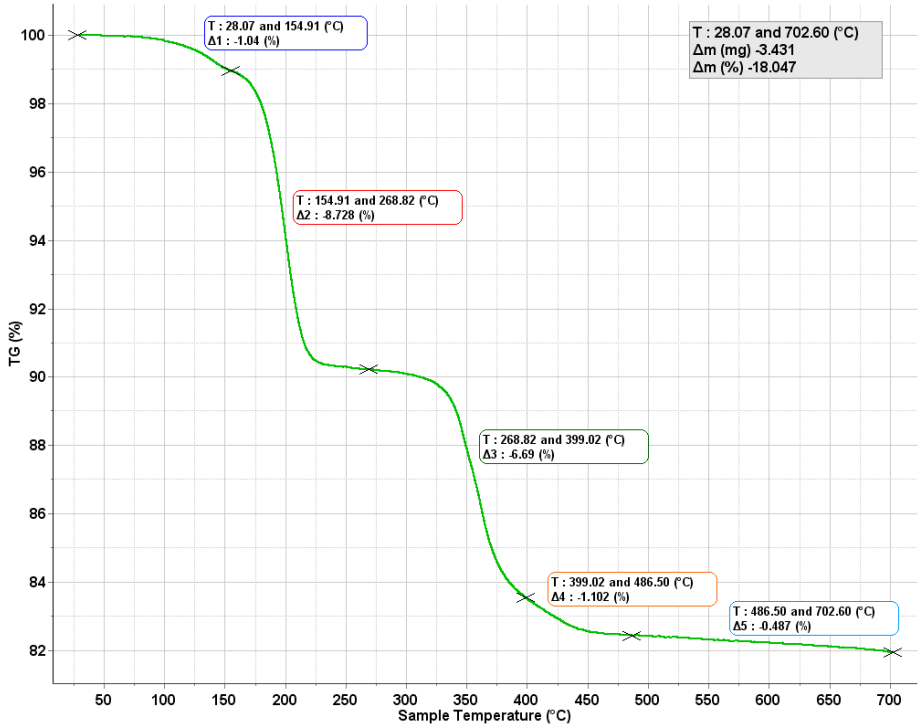
ESI Figure 1. TG and DTG curve of **1a** in He atmosphere



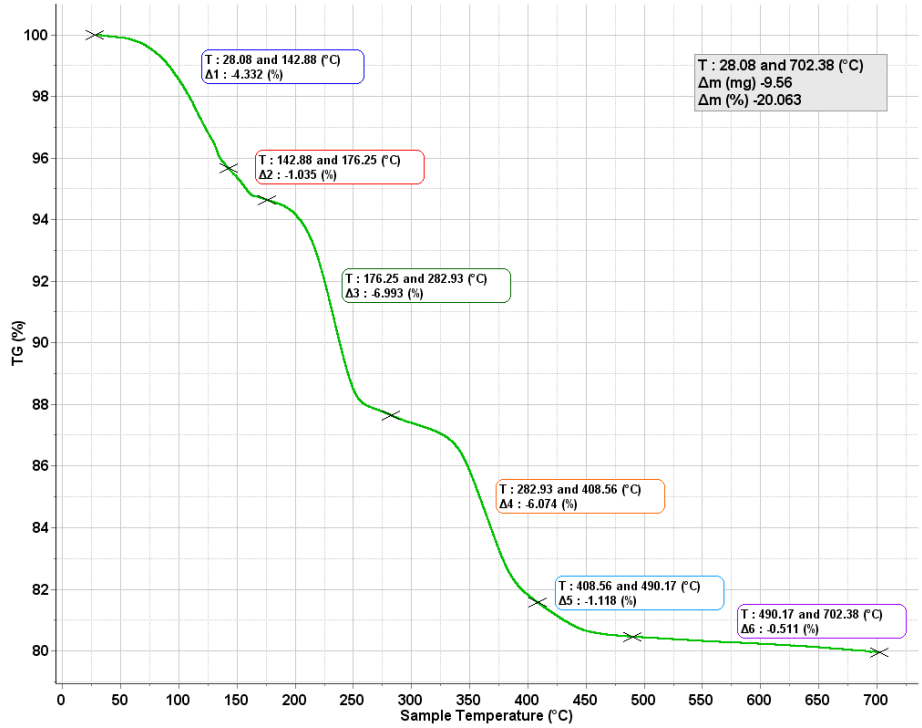
ESI Figure 2. TG and DTG curve of **1a** in He atmosphere

ESI Fig.3. TG curves of compound **1a** (a) and **1b**(b) in He atmosphere

a)

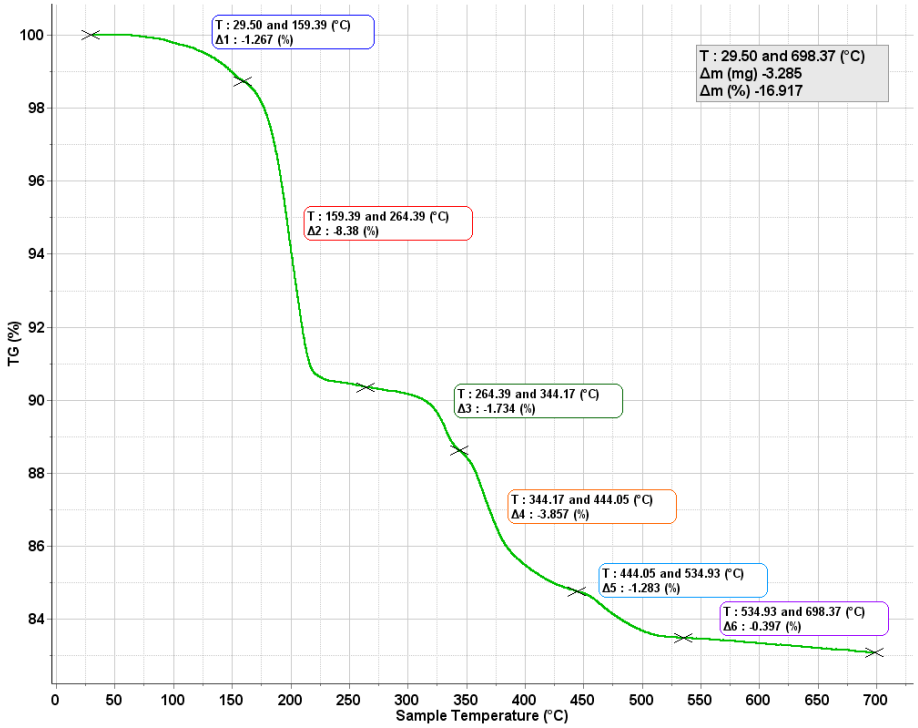


b)

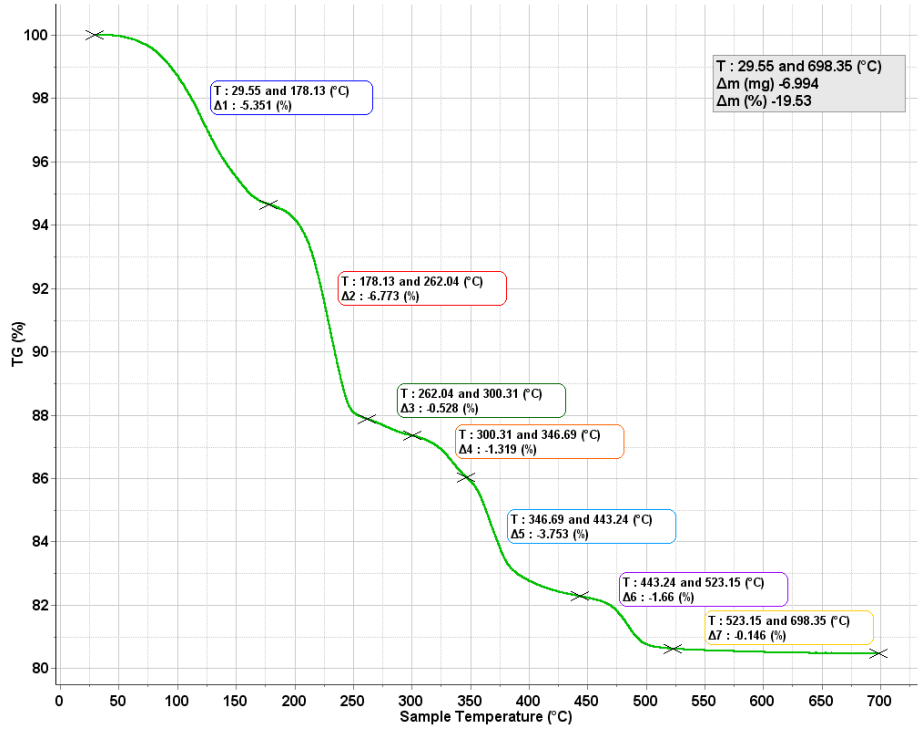


ESI Fig.4. TG curves of compound **1a** (a) and **1b**(b) in synthetic air atmosphere

a)

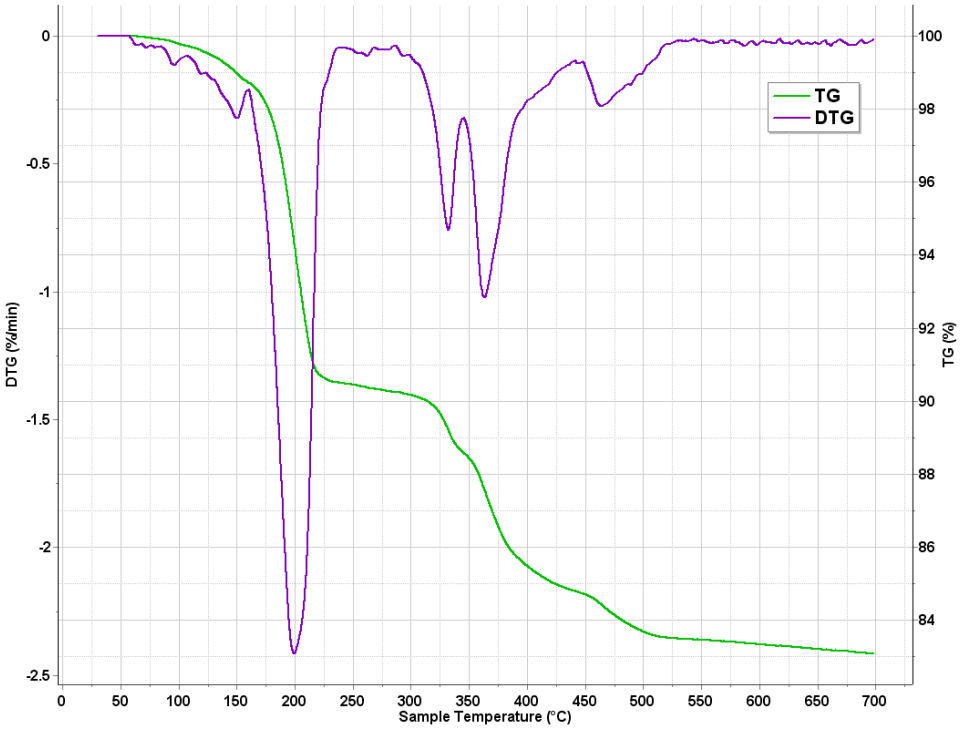


b)



ESI Fig. 5. TG and DTG curves of compounds **1a** (a) and **1b** (b) in synthetic air atmosphere

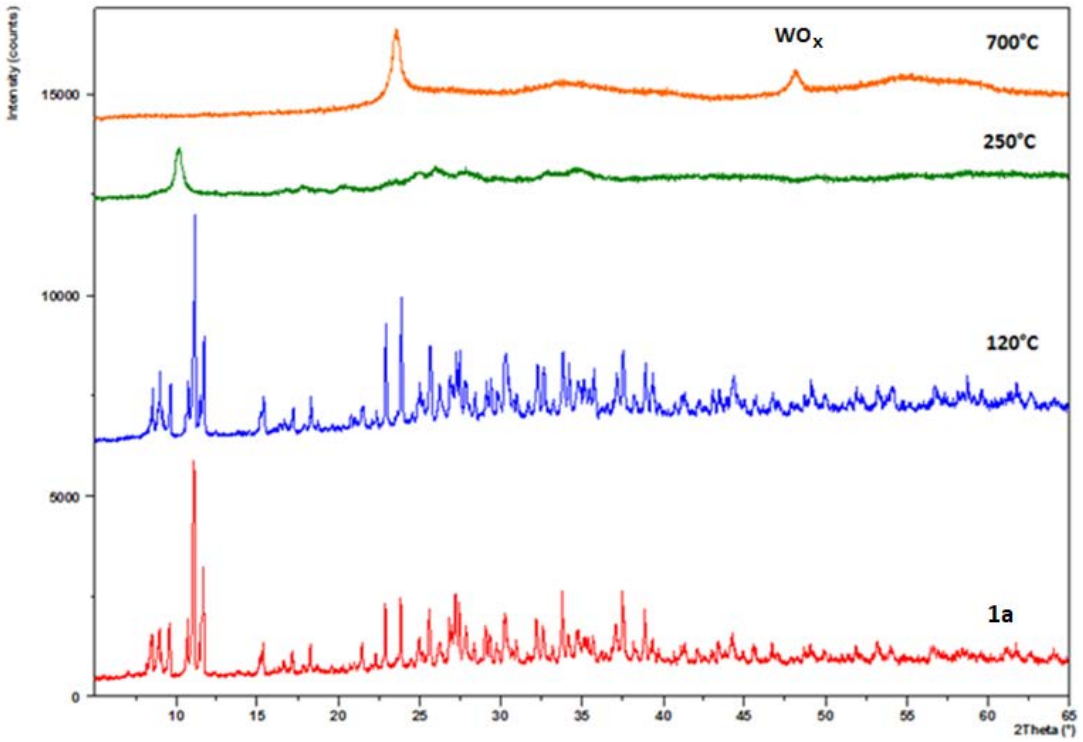
a)



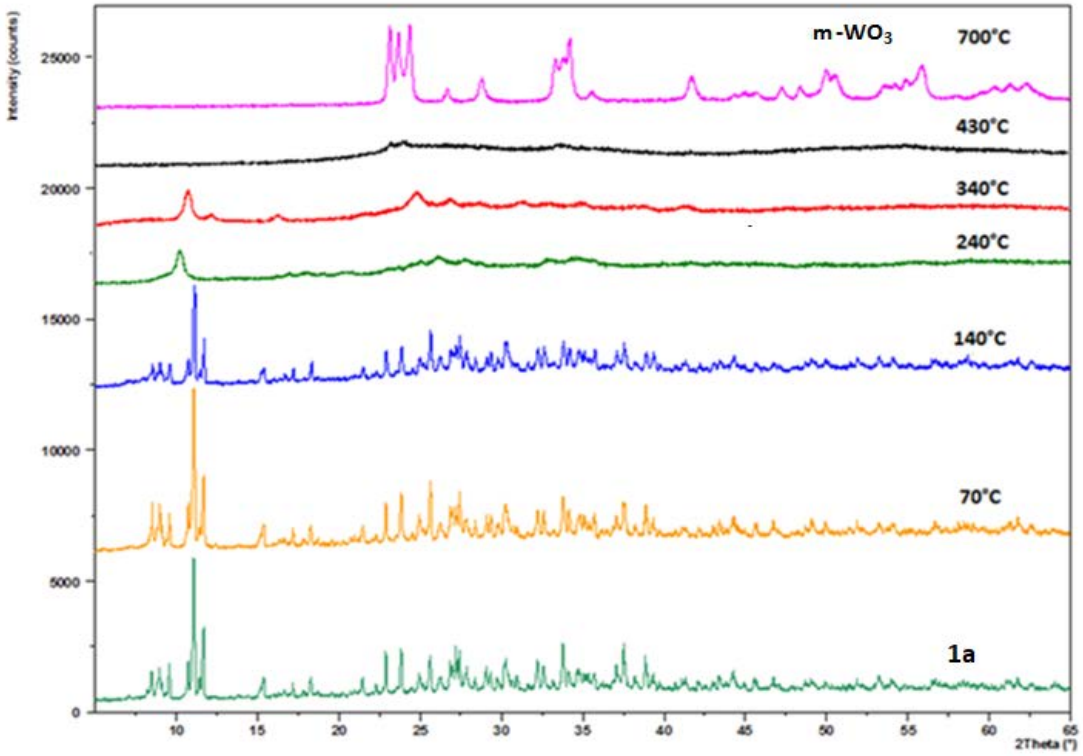
b)

ESI Fig.6. XRD of the **1a** and its thermal decomposition product in inert (a) and synthetic air (b) atmosphere

a)

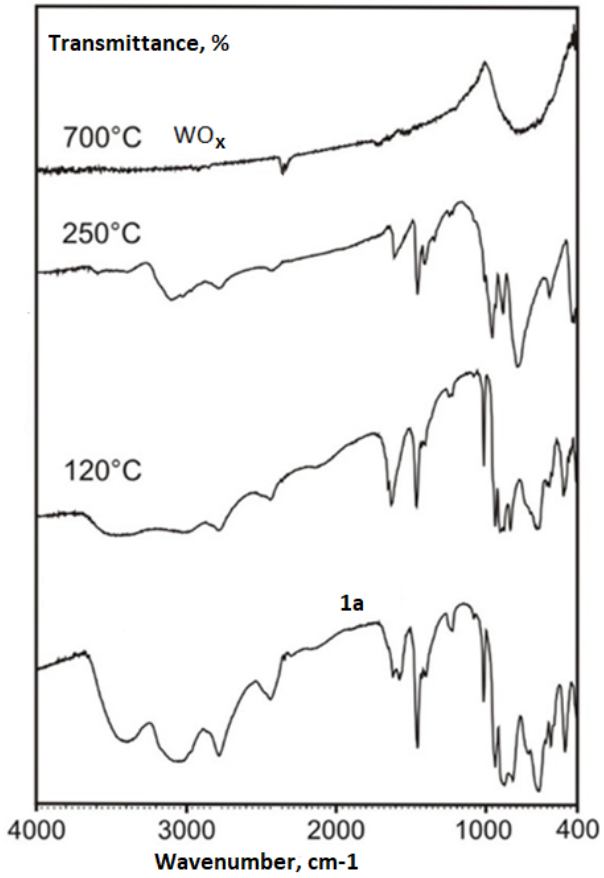


b)

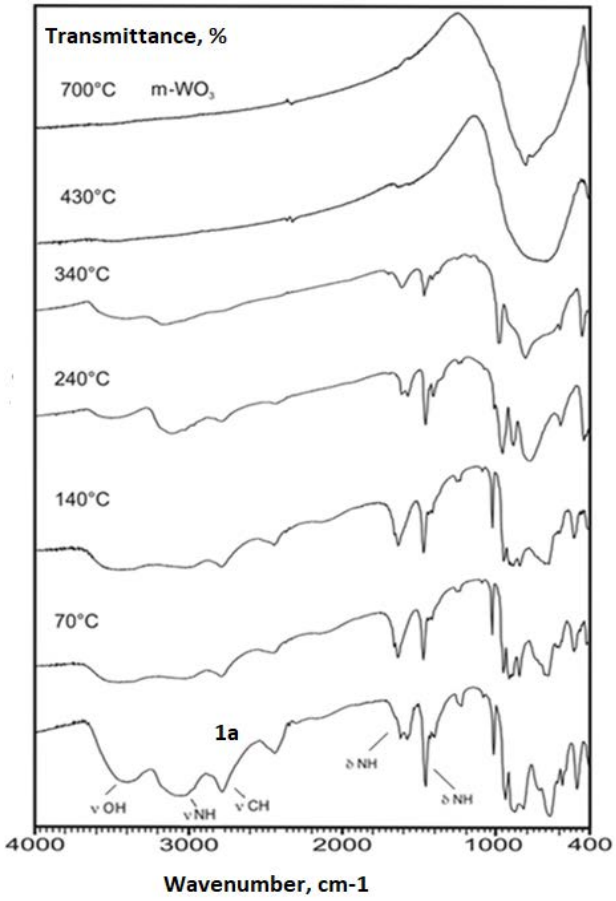


ESI Fig.7. IR of the **1a** and its thermal decomposition product in inert (a) and synthetic air (b) atmosphere

a)

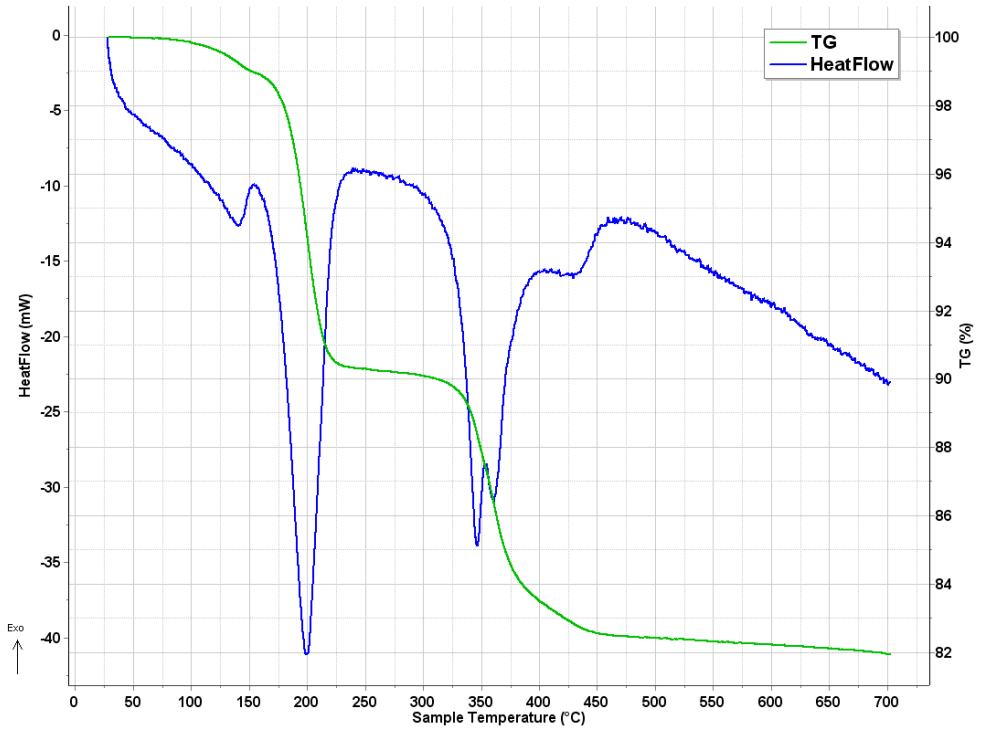


b)

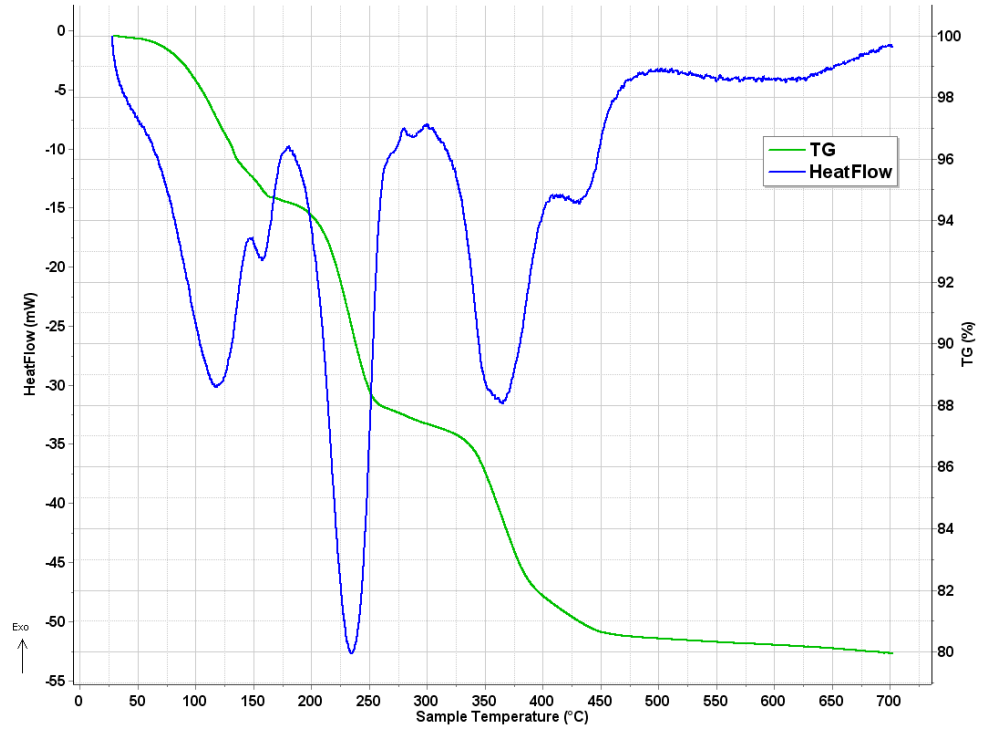


ESI Fig 8. TG and DSC curves of compound **1a** (a) and **1b** (b) in inert atmosphere

a)

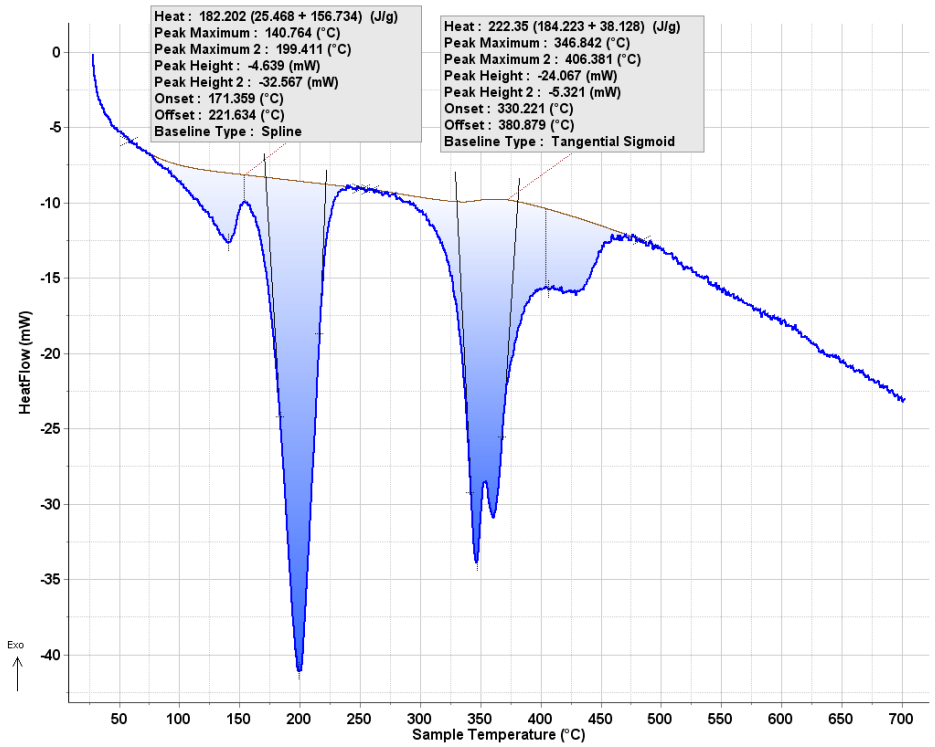


b)

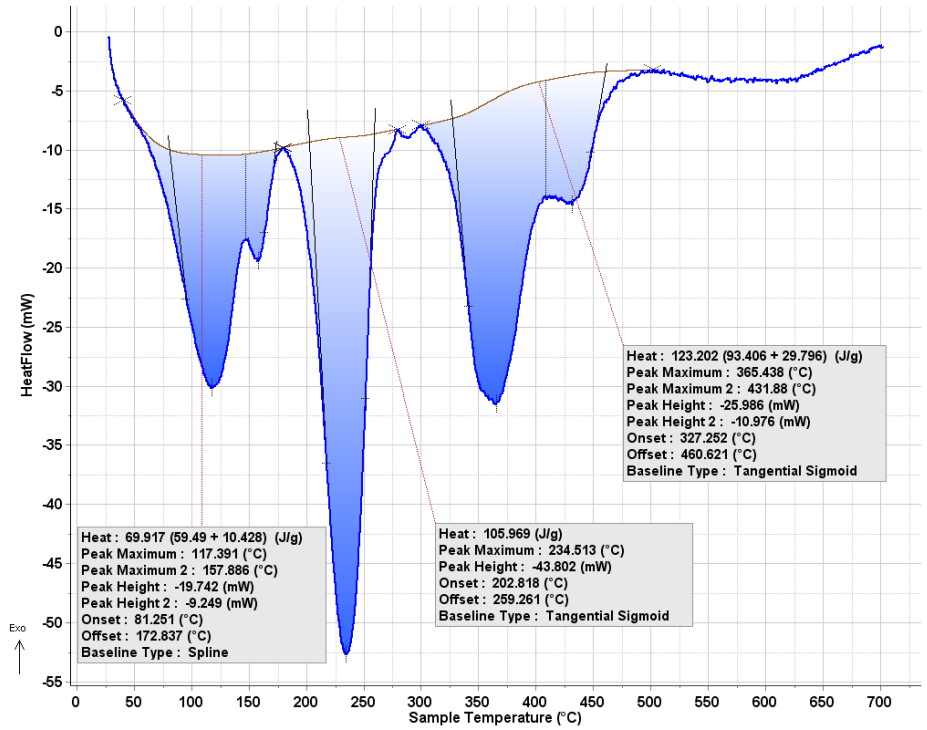


ESI Fig.9. DSC results of compound **1a** (a) and **1b** (b) in inert atmosphere

a)

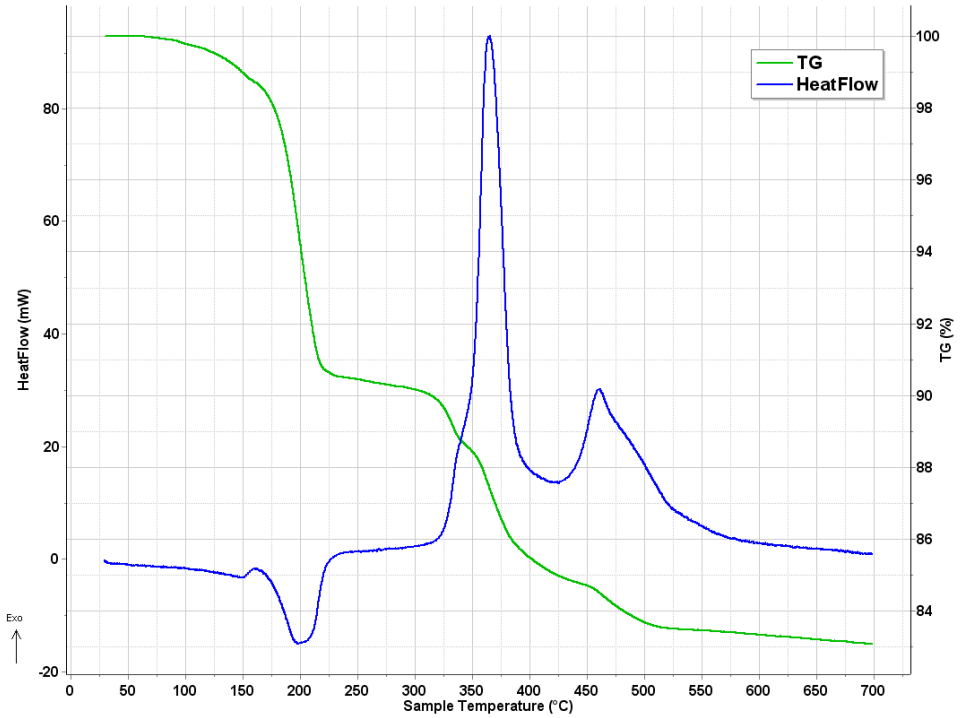


b)

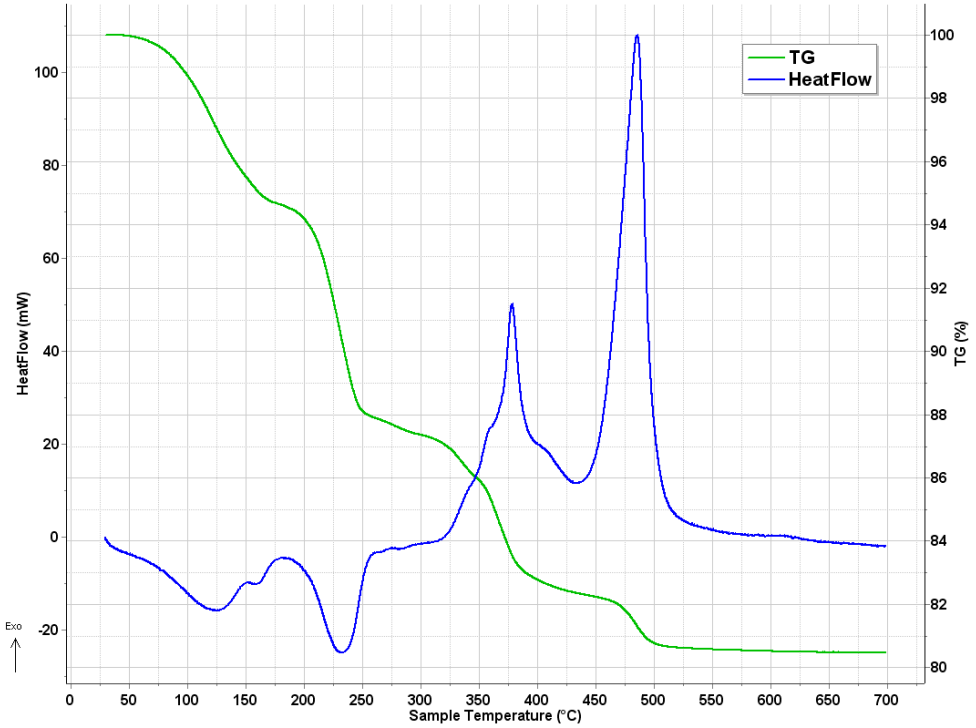


ESI FIg. 10. TG and DSC curves of compound **1a** (a) and **1b** (b) in synthetic air

a)

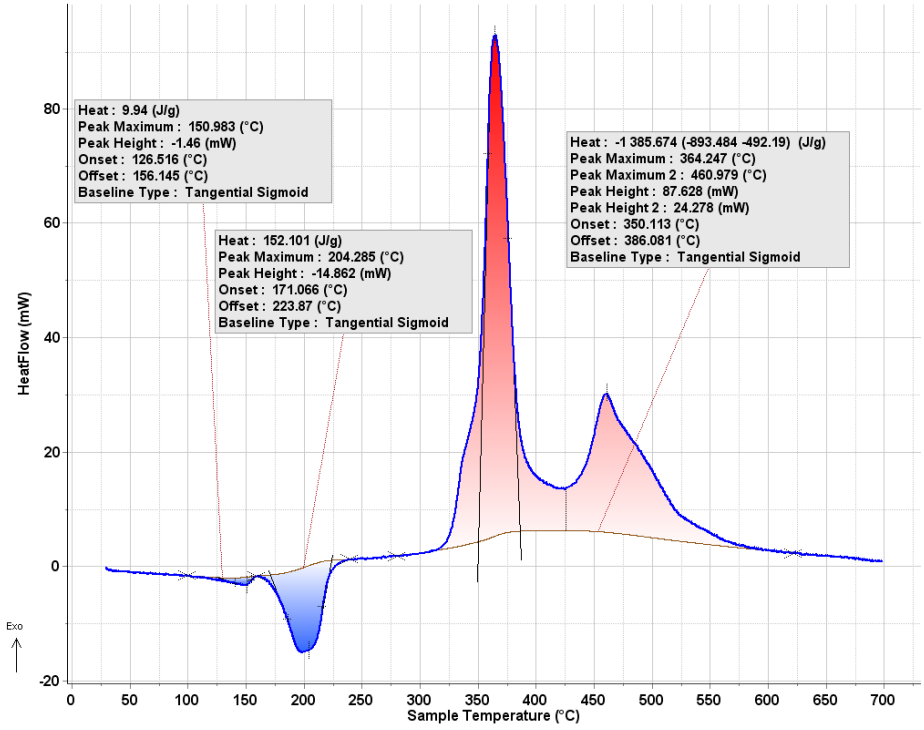


b)

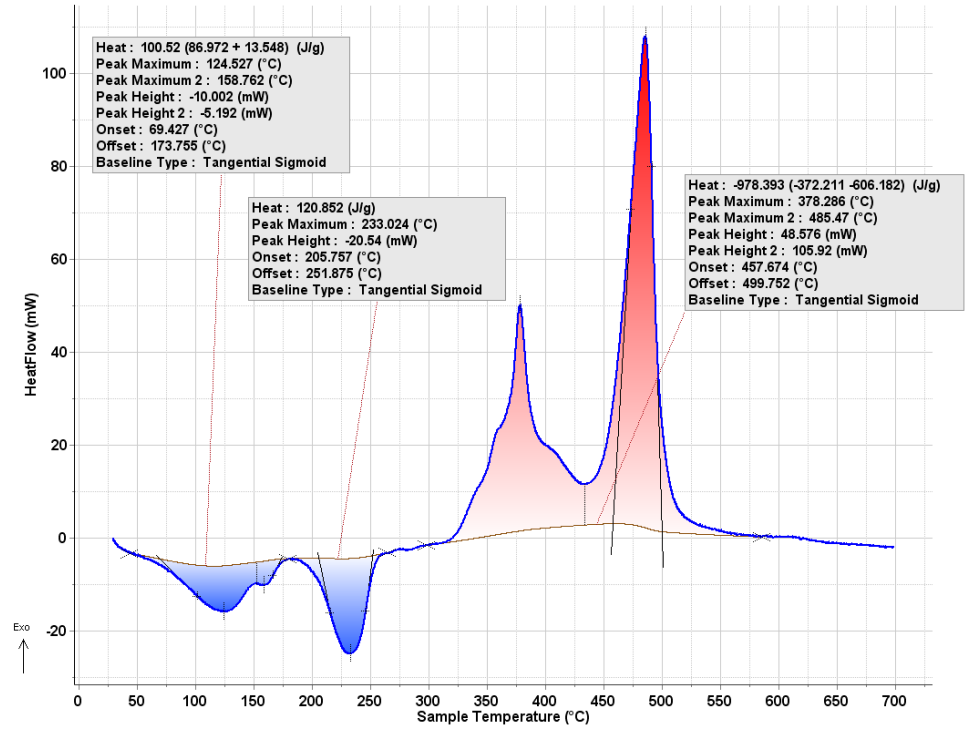


ESI Fig. 11. Quantitative DSC results of compounds **1a** (a) and **1b** (b) on heating under synthetic air atmosphere

a)

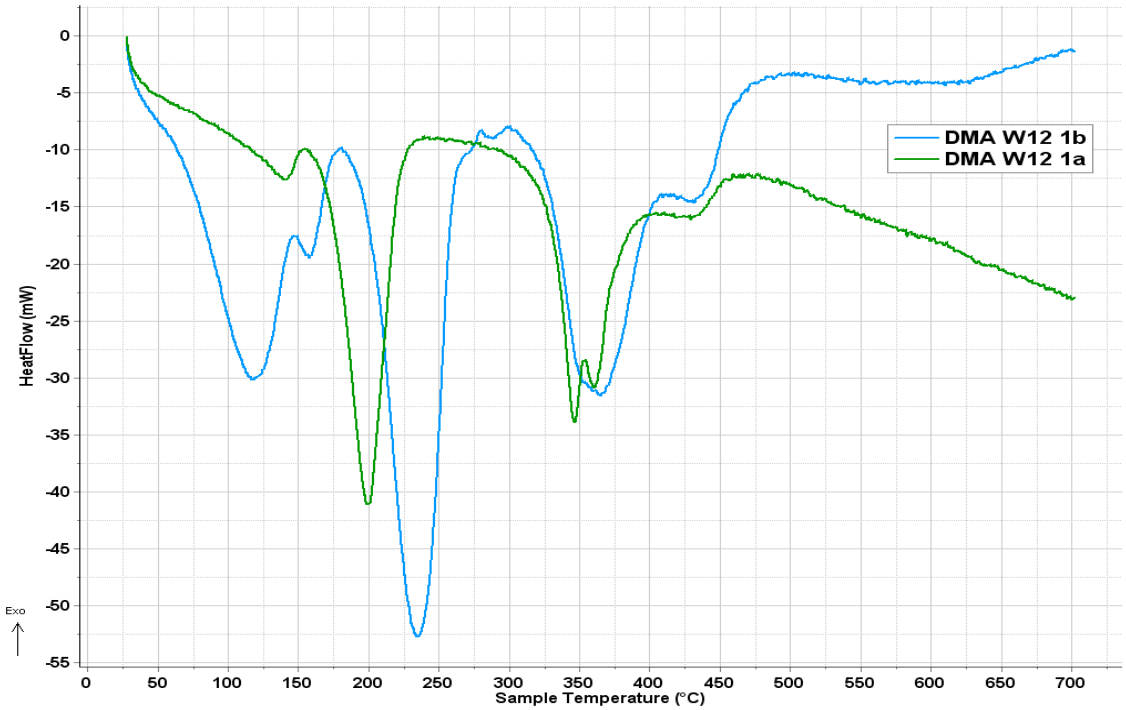


b)

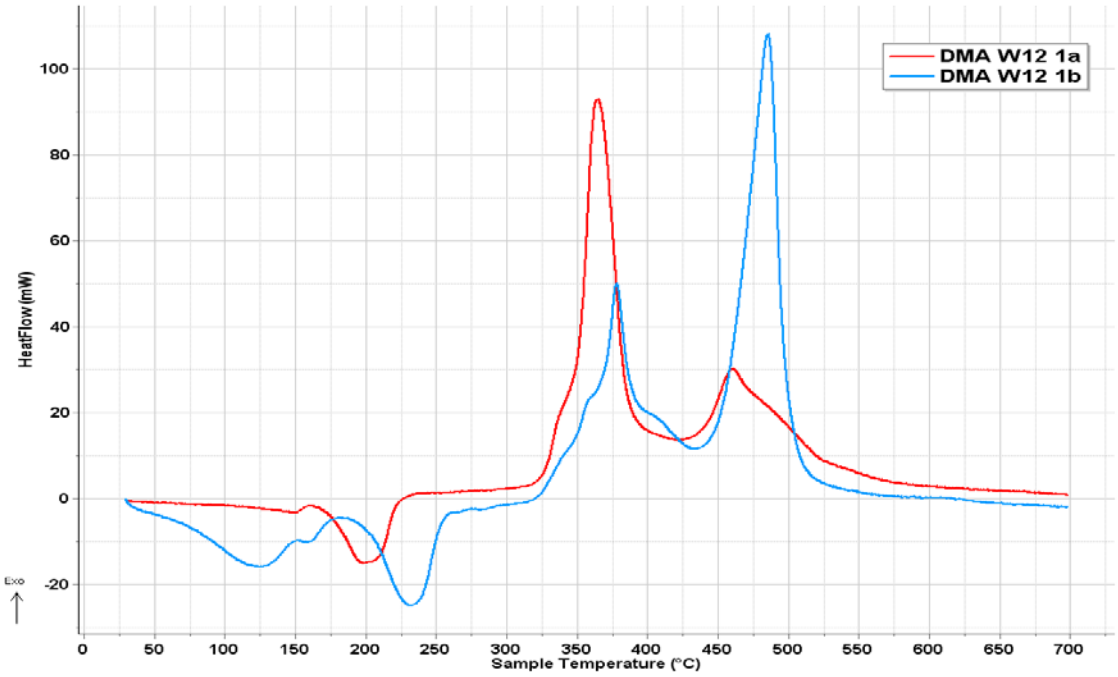


ESI Fig. 12. Comparison of the DSC curves of compounds **1a** and **1b** in inert (a) and synthetic air (b) atmosphere

a)

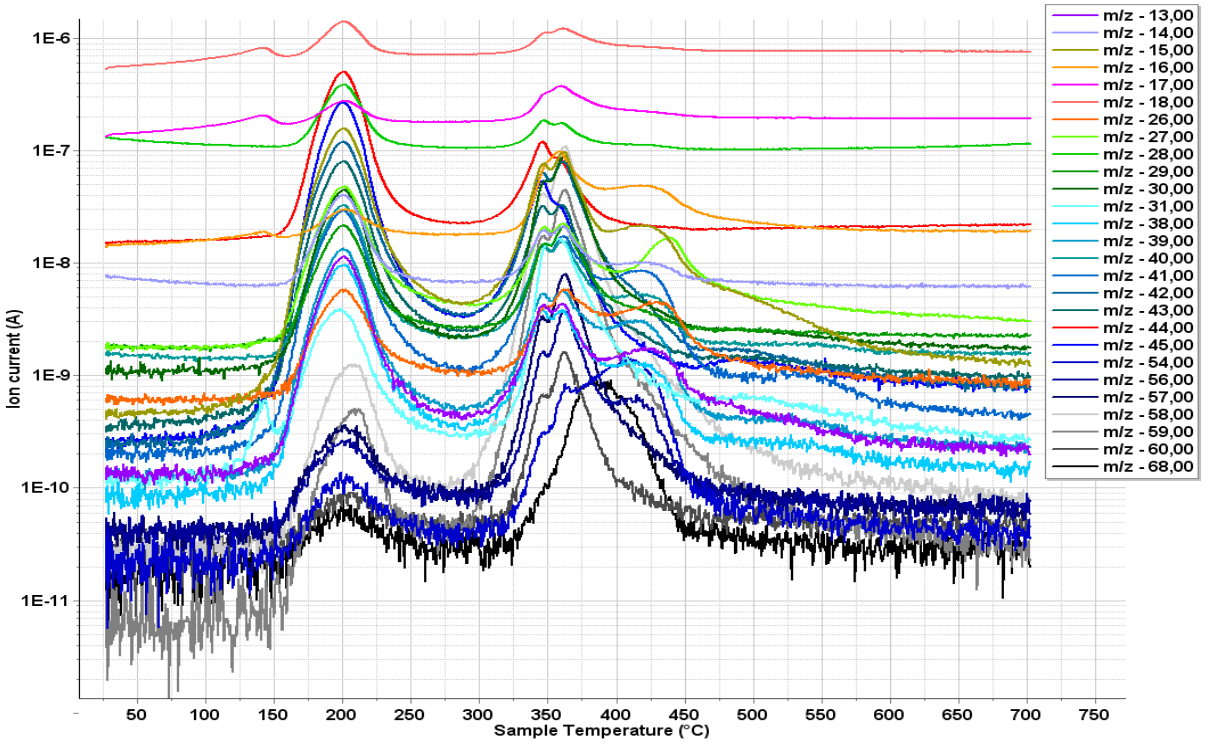


b)

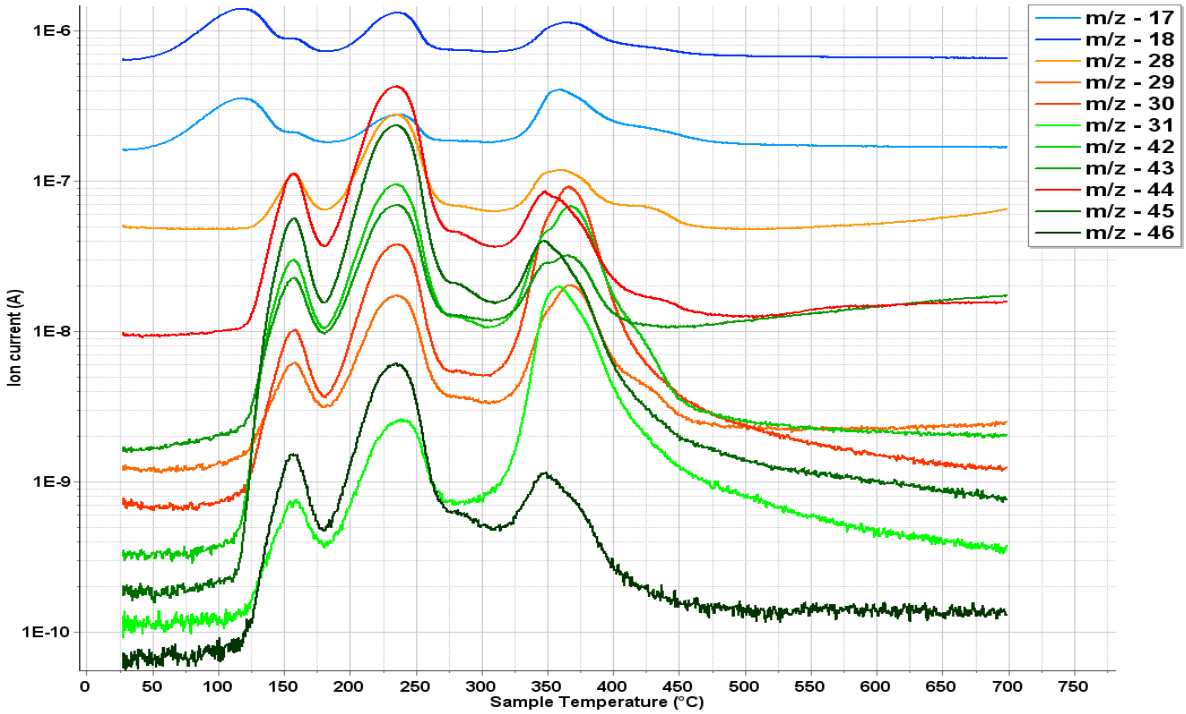


ESI Fig.13. TG-MS curves of the water and DMA fragments measured during thermal decomposition of compound **1a** (a) and **1b** (b) under inert atmosphere

a)

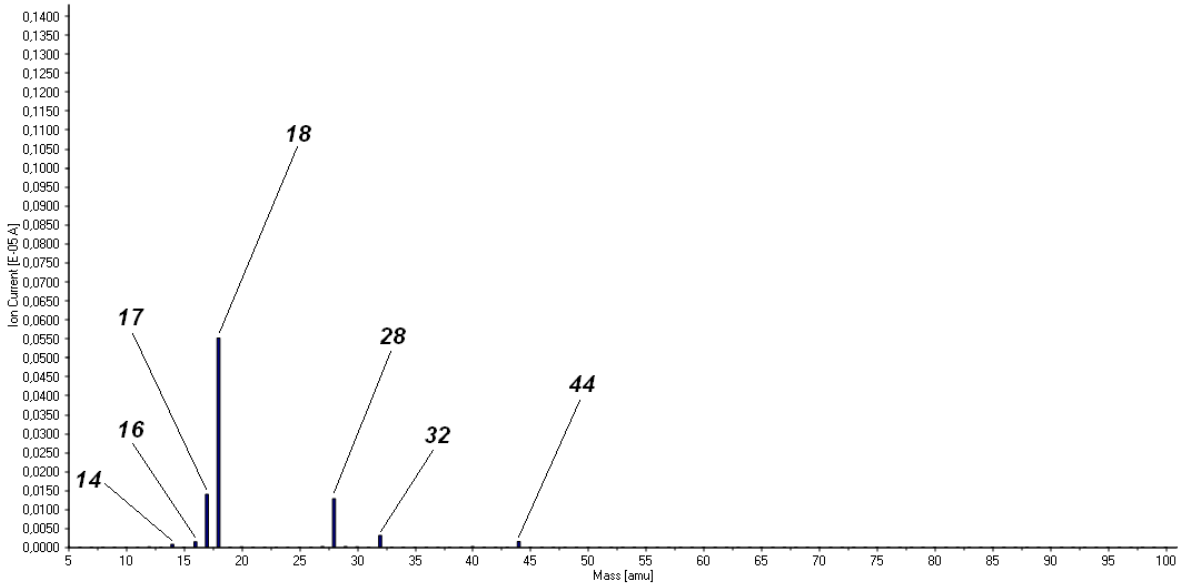


b)

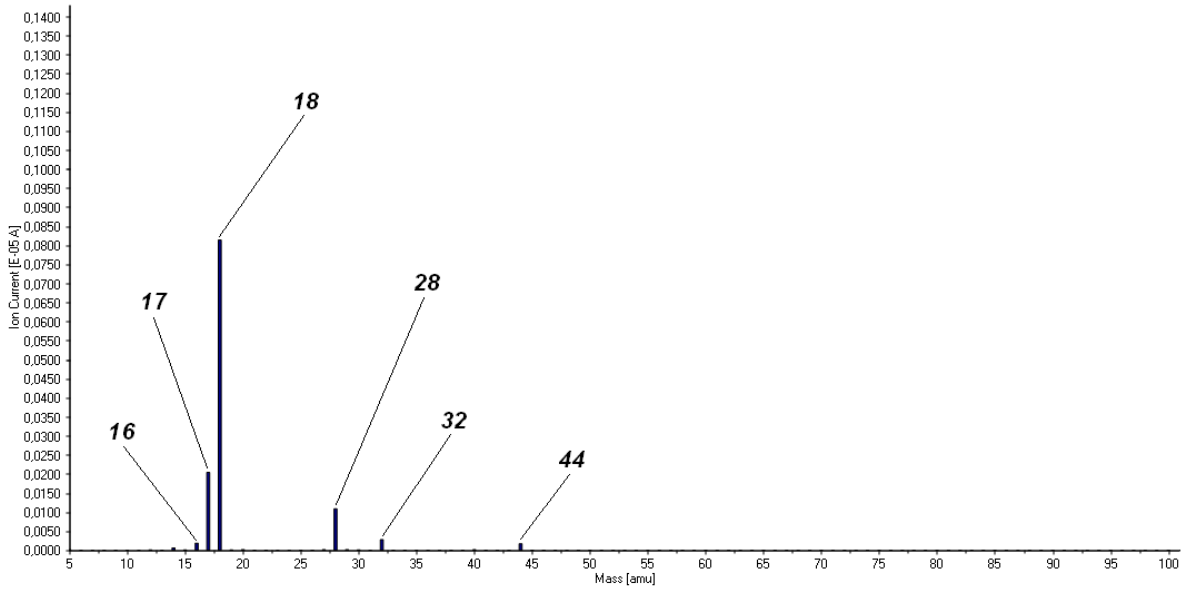


a)

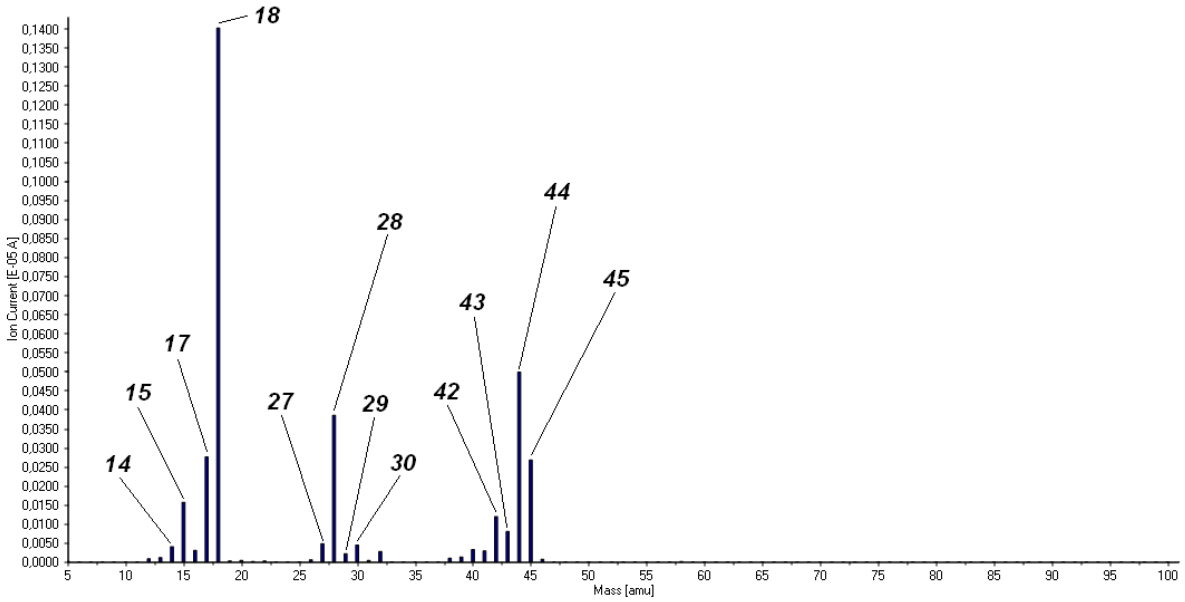
ESI Fig.14. Evolved gas mass spectra of gaseous compounds formed from compound **1a** on heating under inert atmosphere



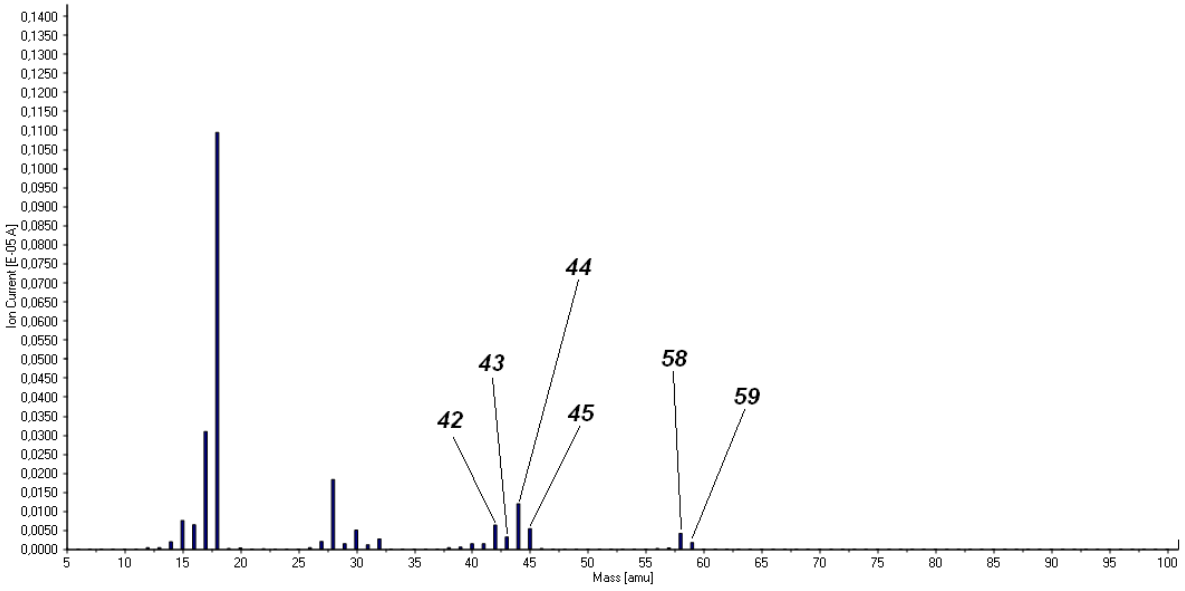
a) T=35 °C



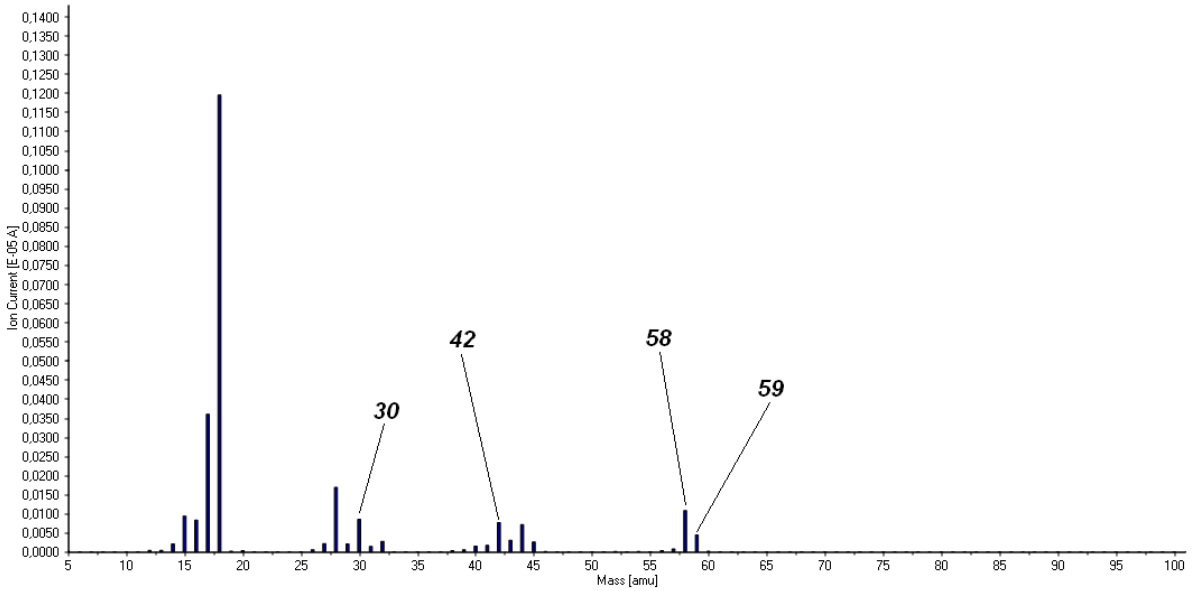
b) 144 °C


18
28
44
45
43
17
15
27
29
42
14
30
Ion Current [E-05 A]
Mass [amu]

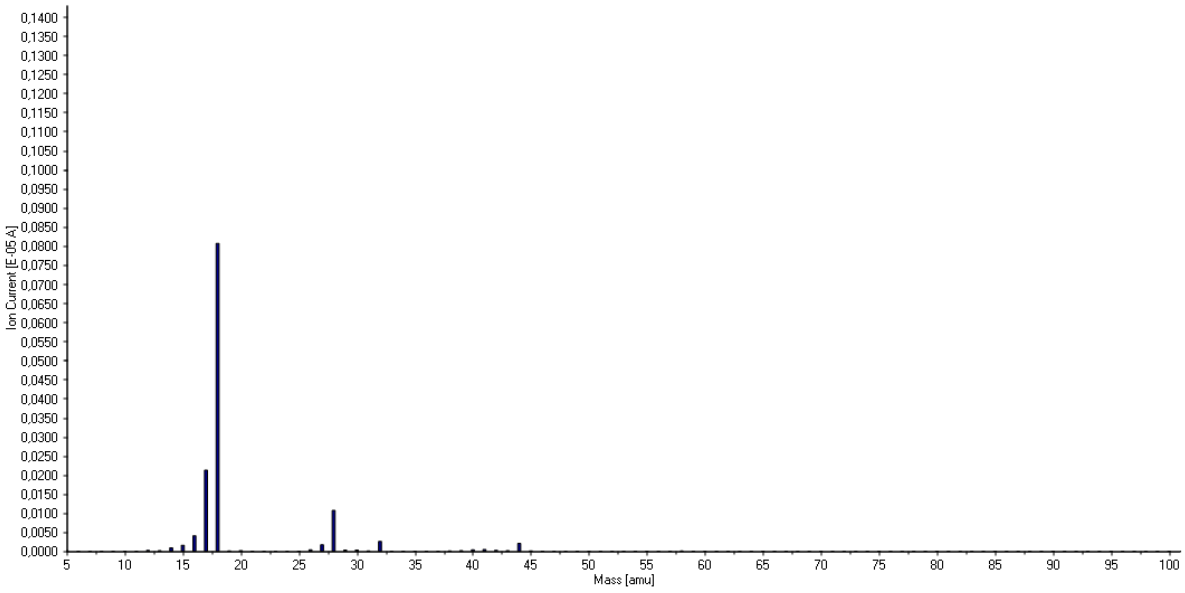
c) 203 °C


44
43
58
59
42
45
Ion Current [E-05 A]
Mass [amu]

d) 348 °C

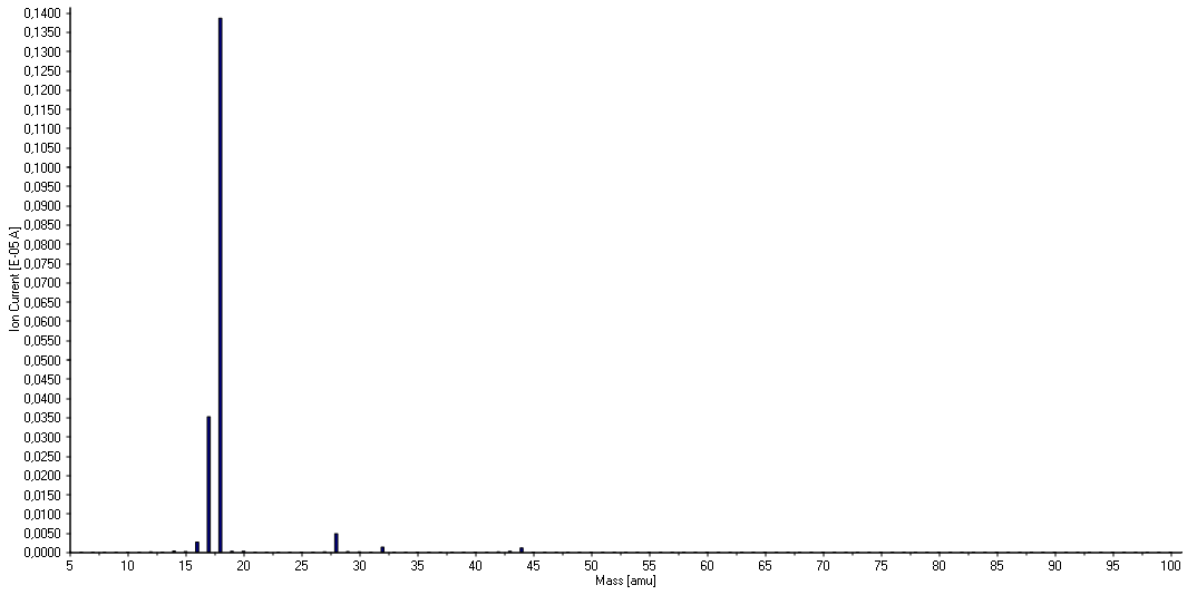

Ion Current [E-05 A]
Mass [amu]
30
42
58
59

e) 365 °C

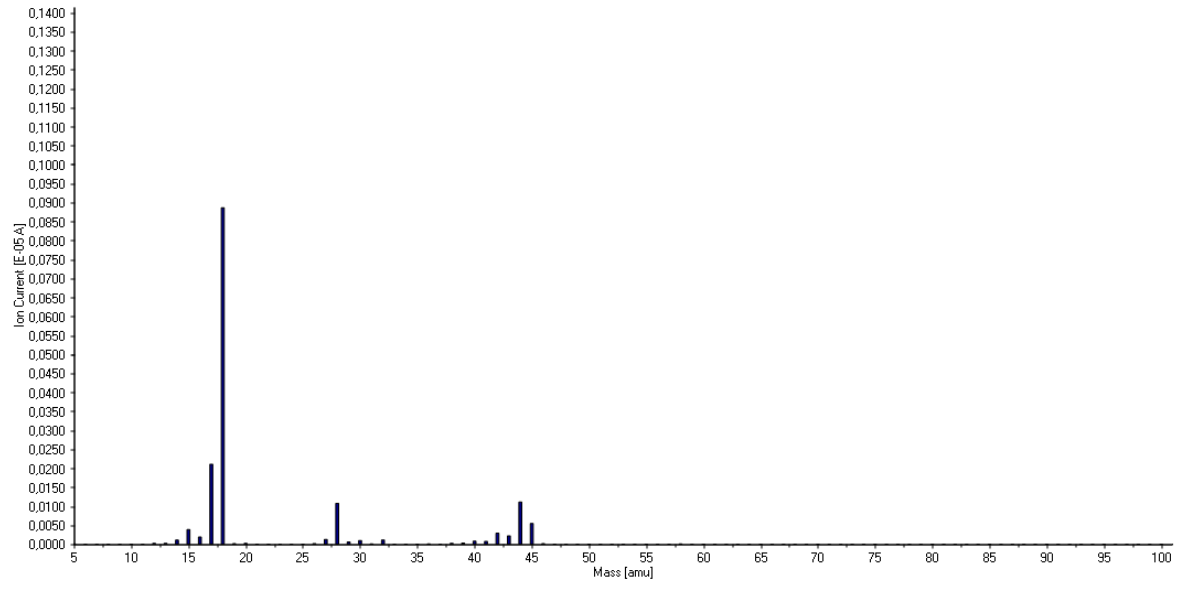

Ion Current [E-05 A]
Mass [amu]

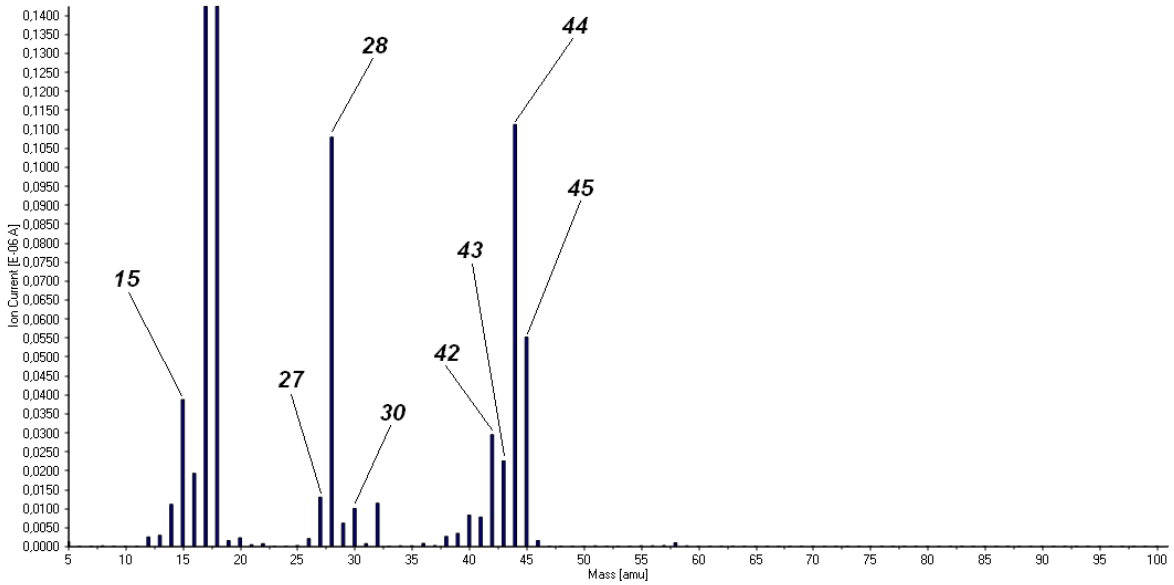
f) 441 °C

ESI Fig.15 . Evolved gas mass spectra of gaseous compounds formed from compound **1b** on heating under inert atmosphere

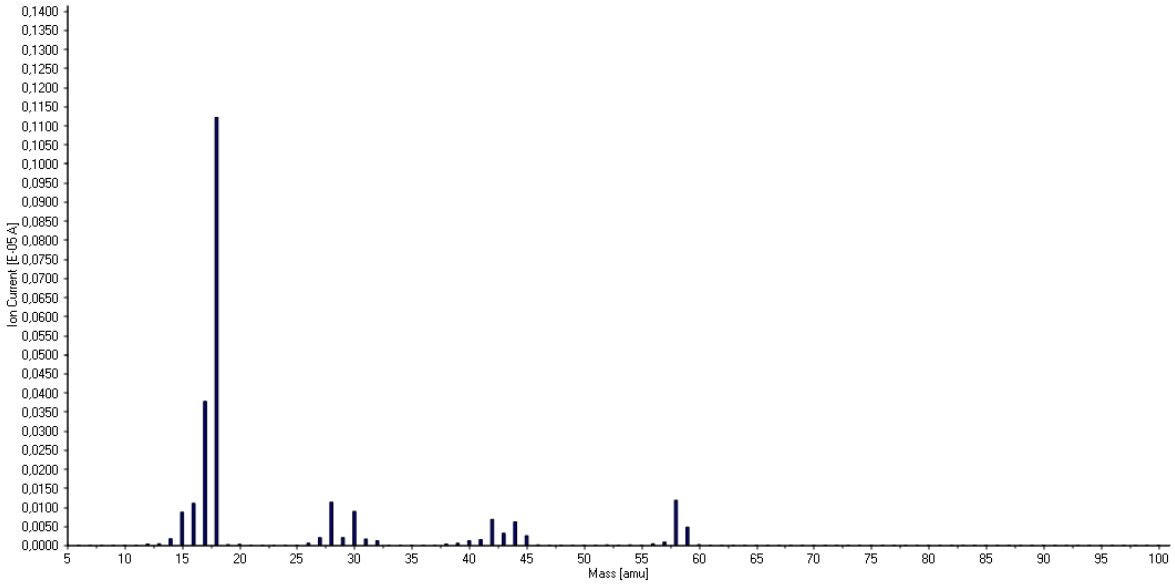


a) T=119 °C

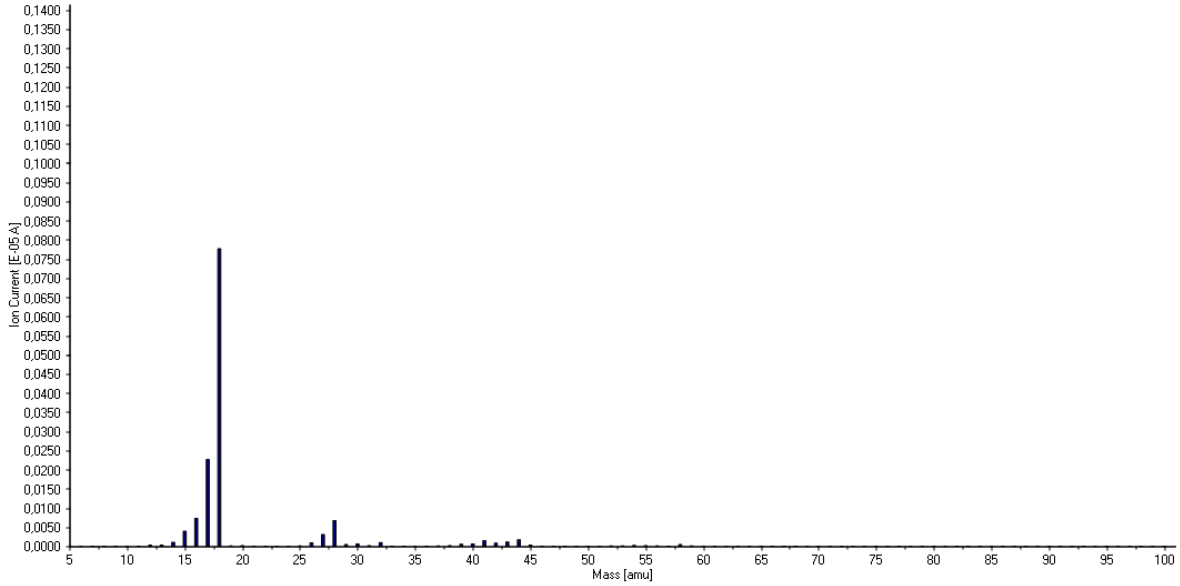




c) 236 °C

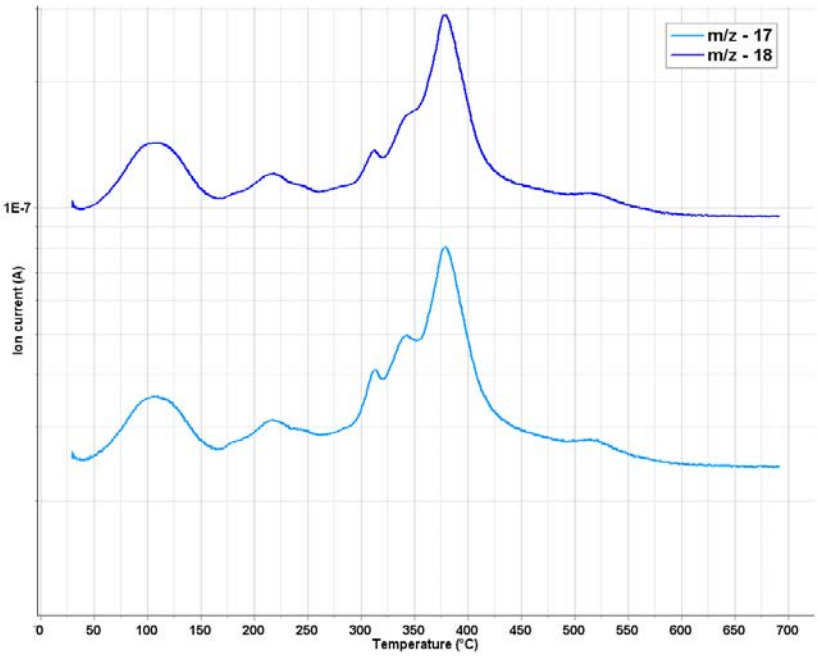


d) T=379 °C

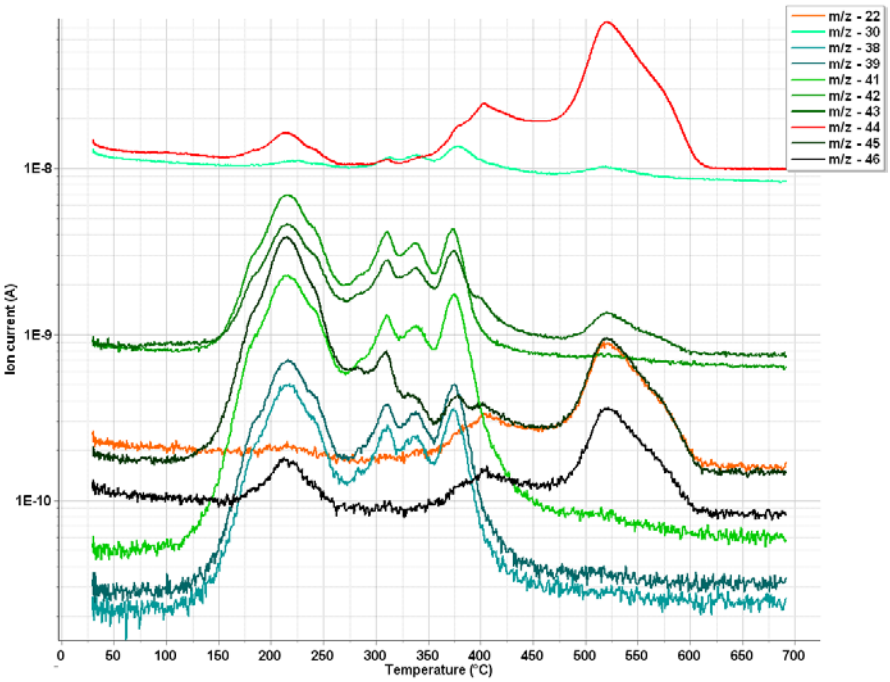


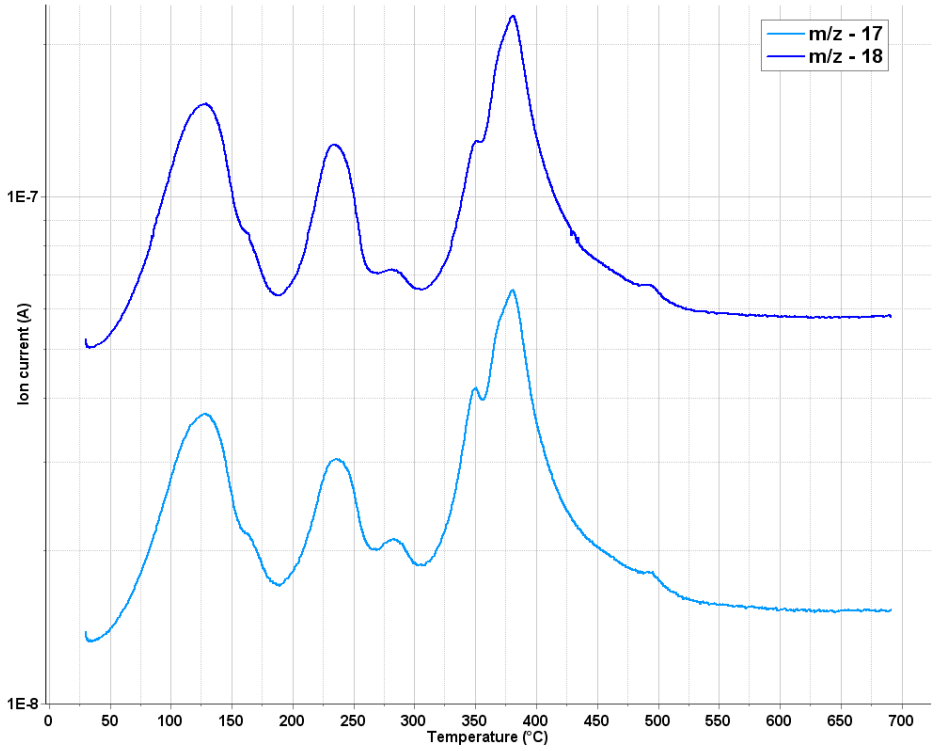
e) 420 °C

ESI Fig. 16. TG-MS curve of compound **1a** in **1b in** air with 5°/h heating rate

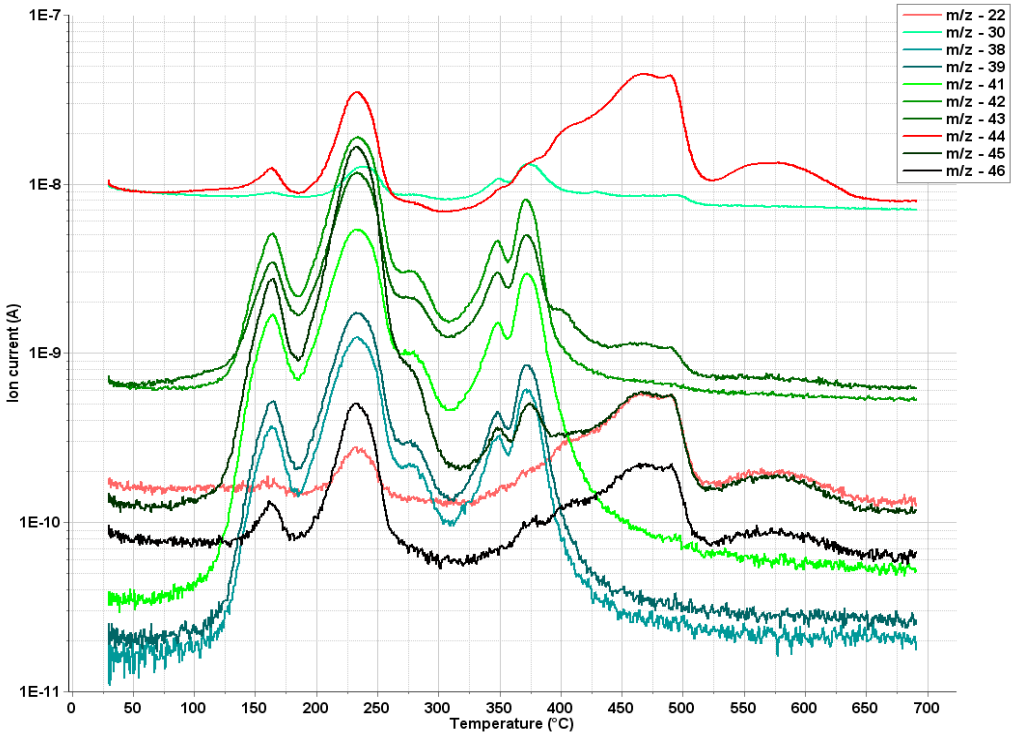


a)

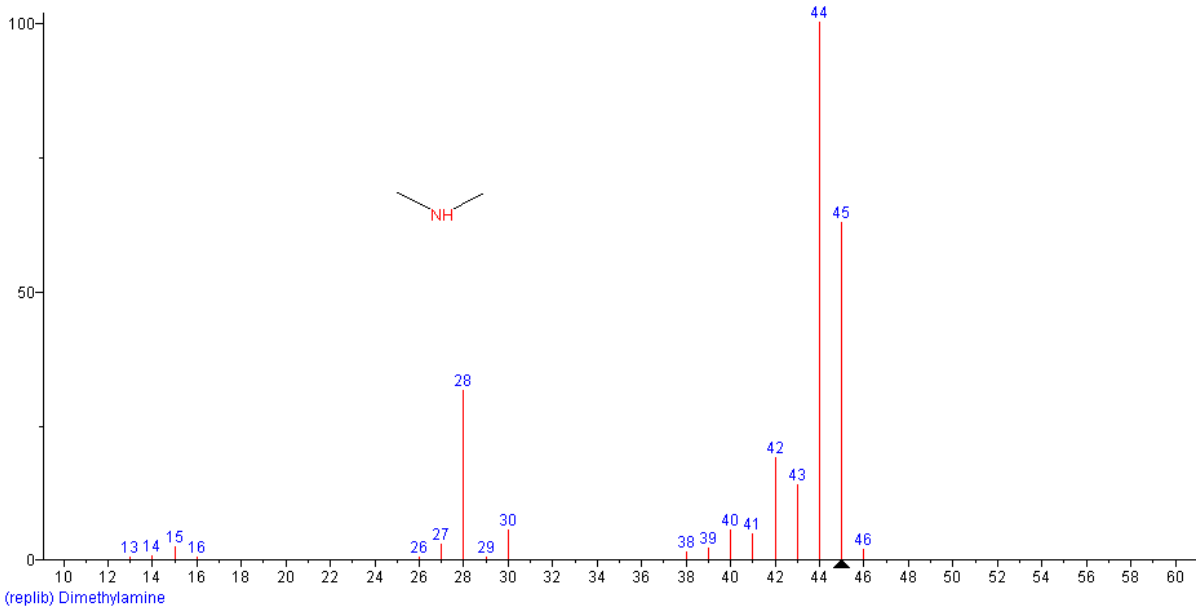



m/z - 17
m/z - 18
1E-7
1E-8
Ion current (A)
0
50
100
150
200
250
300
350
400
450
500
550
600
650
700
Temperature (°C)

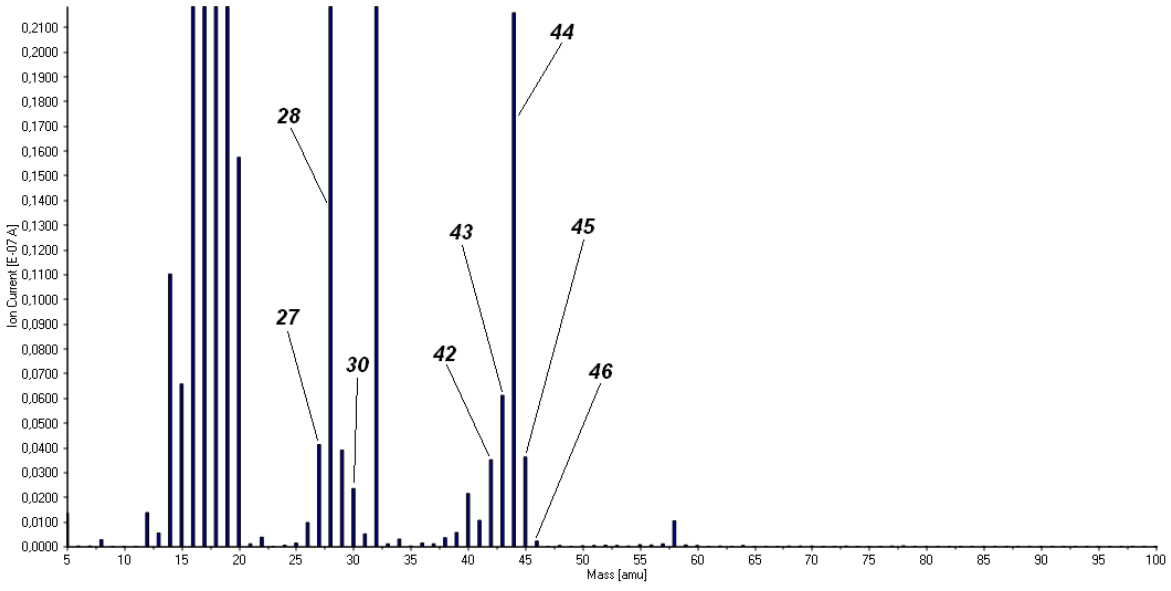
b)


m/z - 22
m/z - 30
m/z - 38
m/z - 39
m/z - 41
m/z - 42
m/z - 43
m/z - 44
m/z - 45
m/z - 46
1E-7
1E-8
1E-9
1E-10
1E-11
Ion current (A)
0
50
100
150
200
250
300
350
400
450
500
550
600
650
700
Temperature (°C)

ESI Fig.17. Dimethylamine NIST reference (a) and analog mass spectrum at 98 °C with our instrument (b)

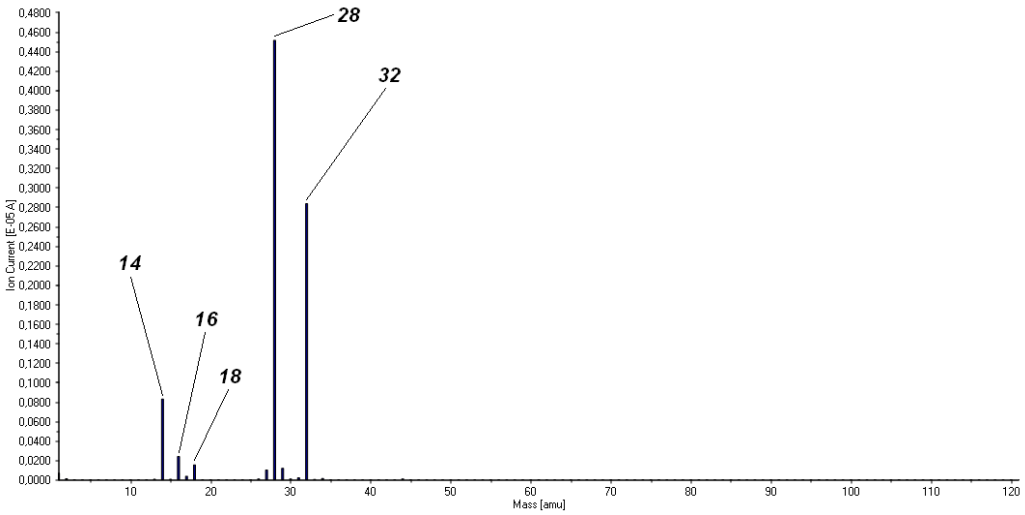


a) Dimethylamine NIST MS spectrum

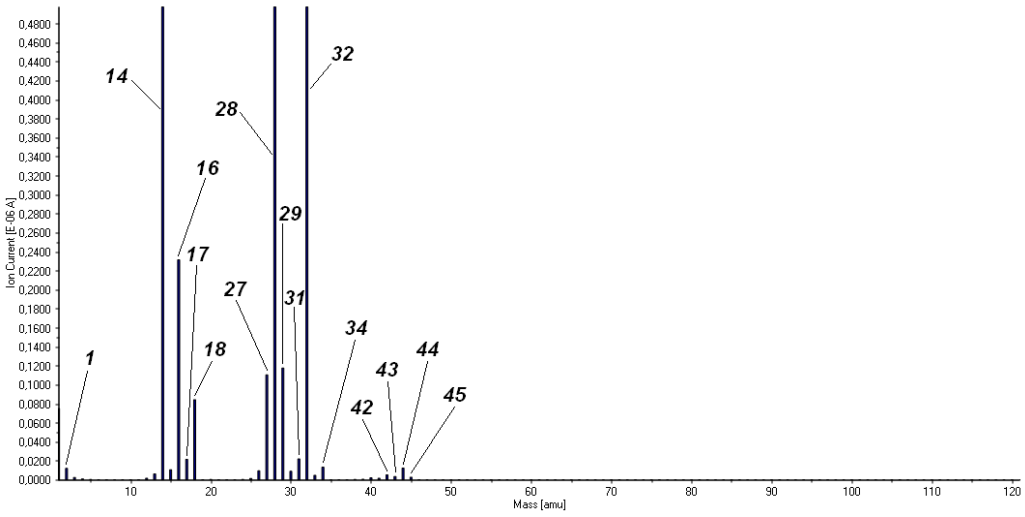


b) Dimethylamine MS spectrum measured by us in inert atmosphere

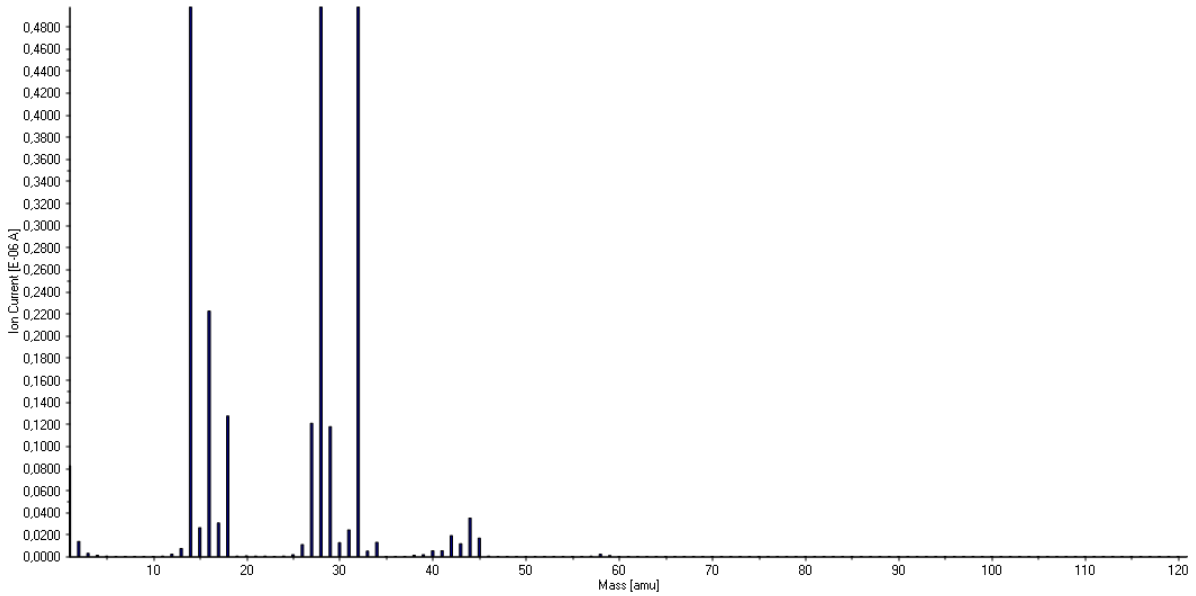
ESI Fig.18 . Evolved gas mass spectra of gaseous compounds formed from compound **1b** on heating in synthetic air atmosphere



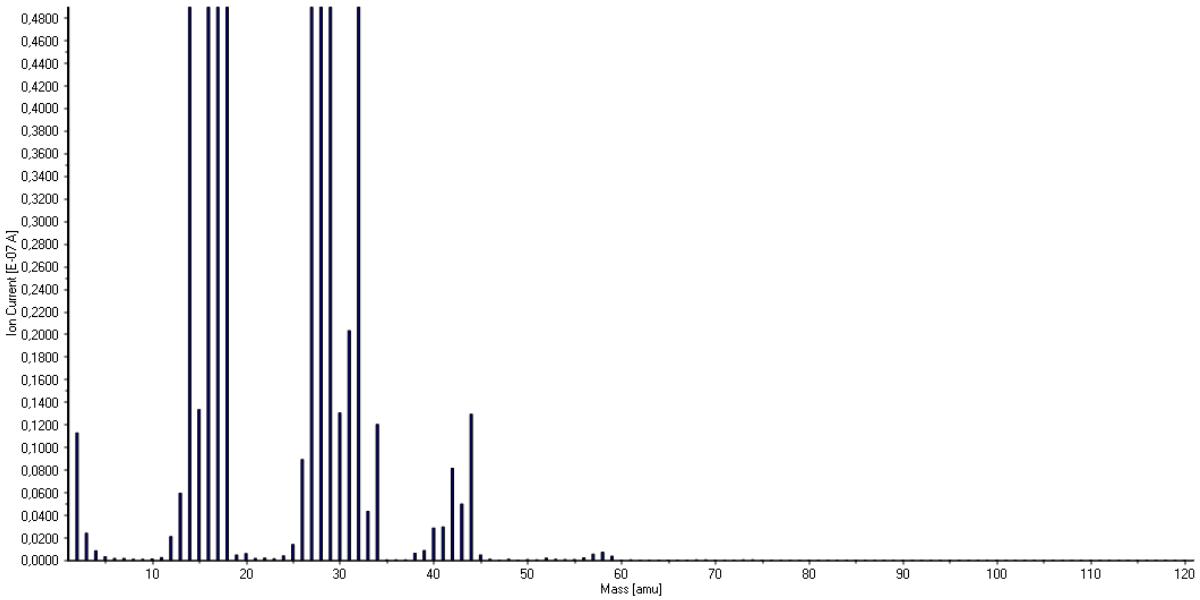
a) 131 °C



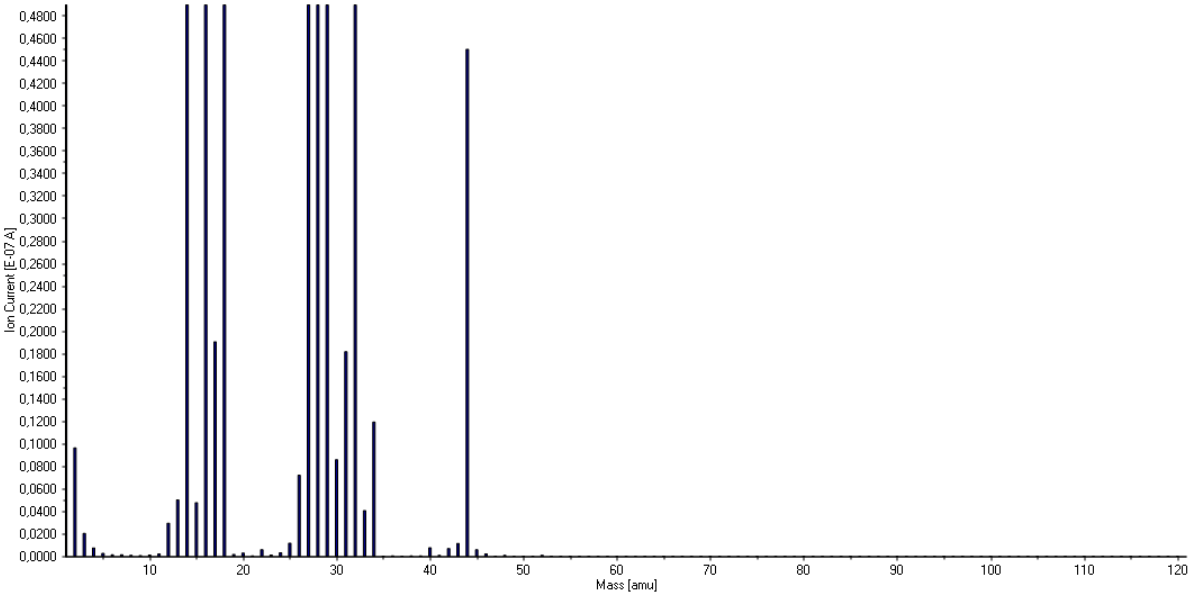
b) 166 °C (zoom 10x)



c) 236 °C (10x zoom)

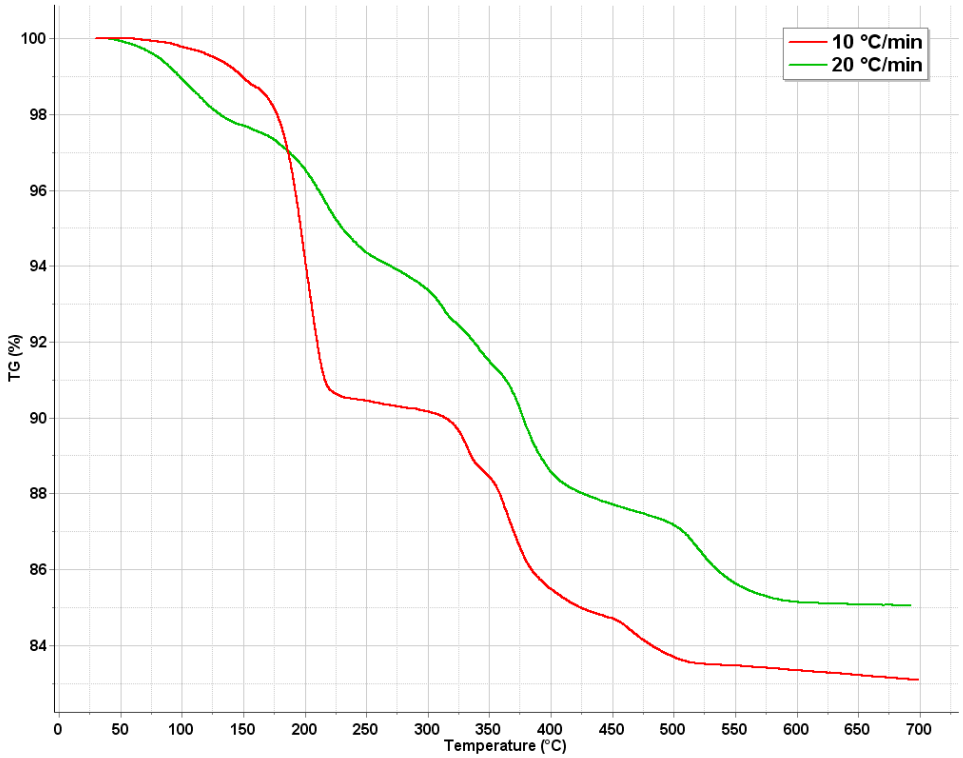


d) 373 °C (100 x zoom)

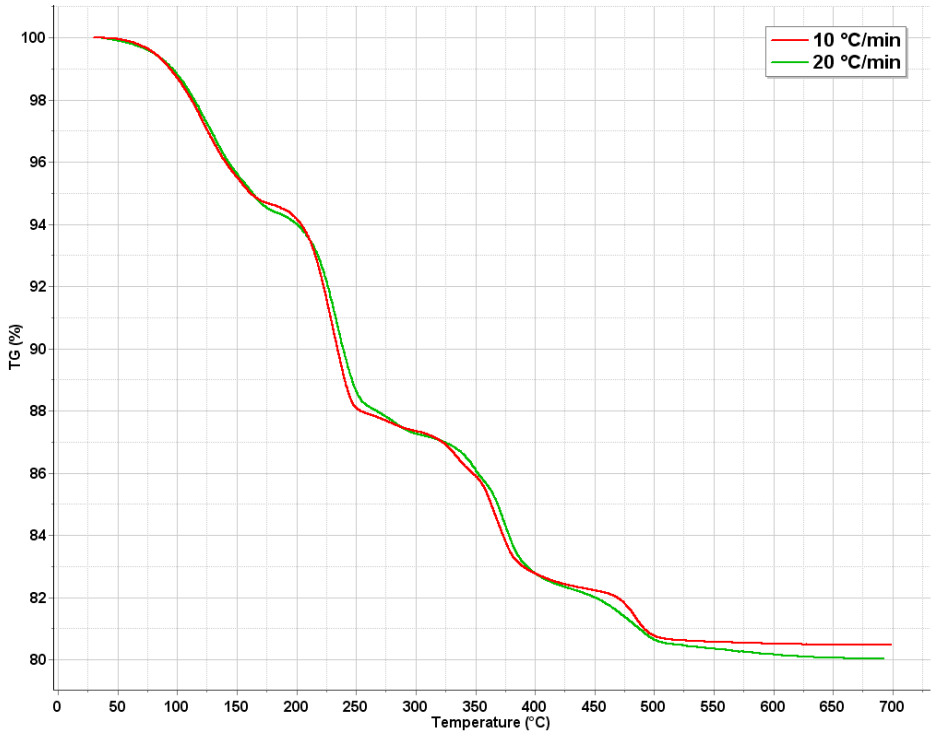


e) 471 °C (100 x zoom)

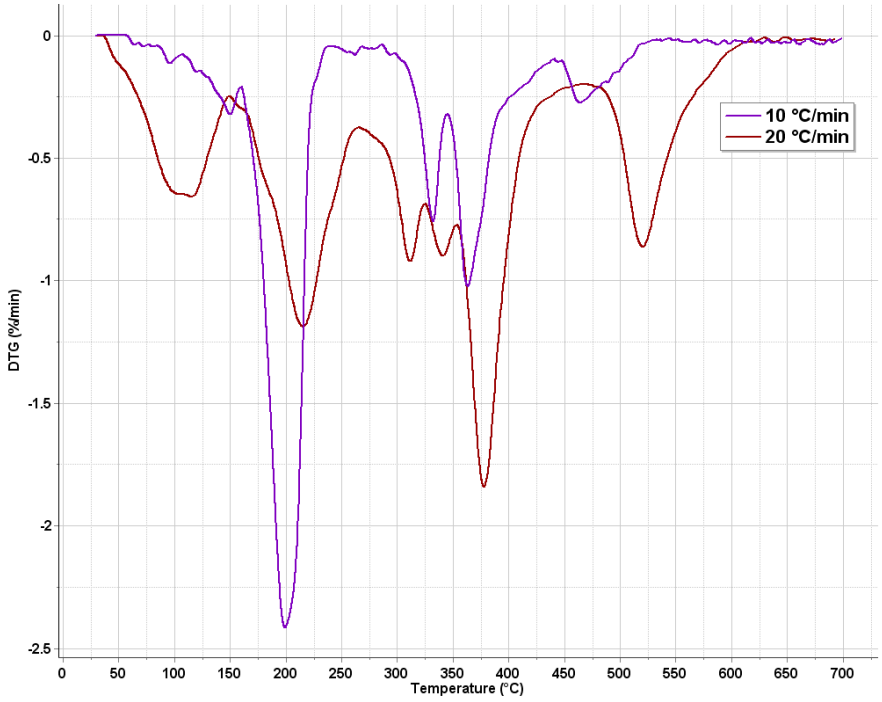
ESI Figure 19. The effect of heating rate (10 and 20 °C/min) on the decomposition characterisrtics of compounds 1a and 1b in air



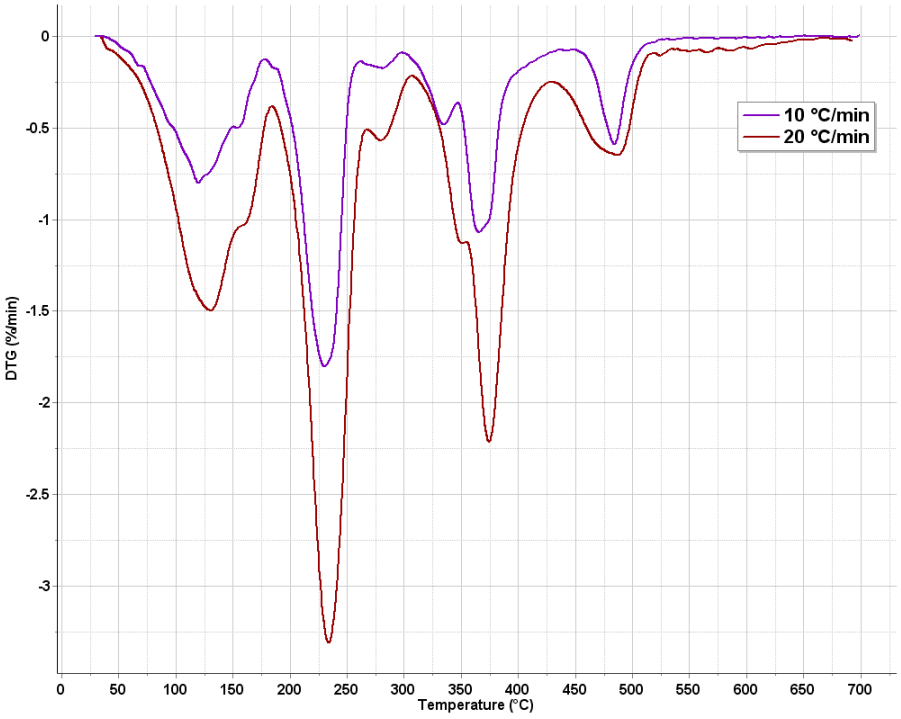
a) TG curves of compound **1a** in air



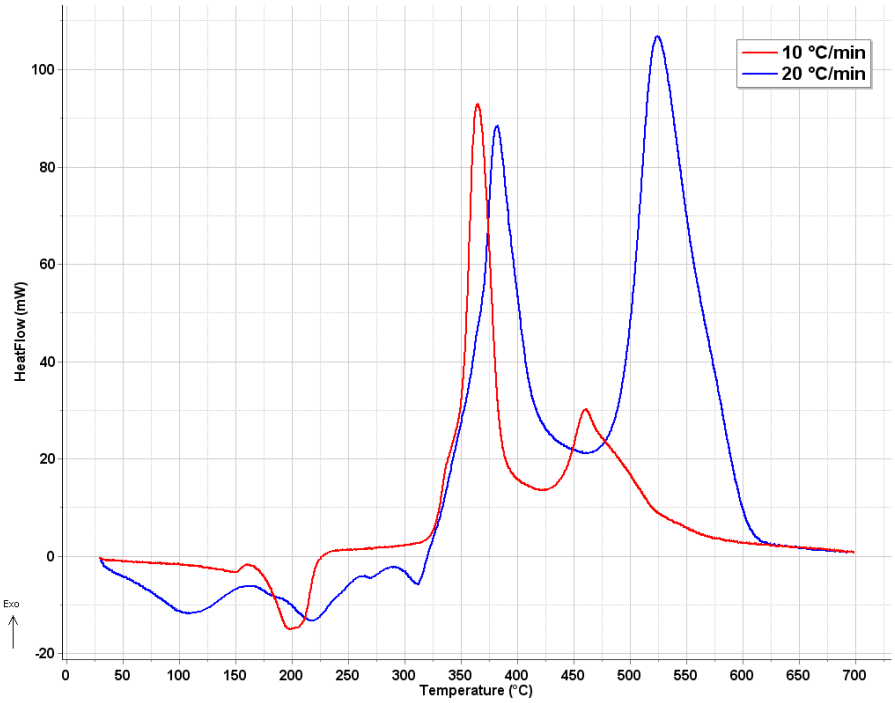
b) TG curves of compound **1b** in air



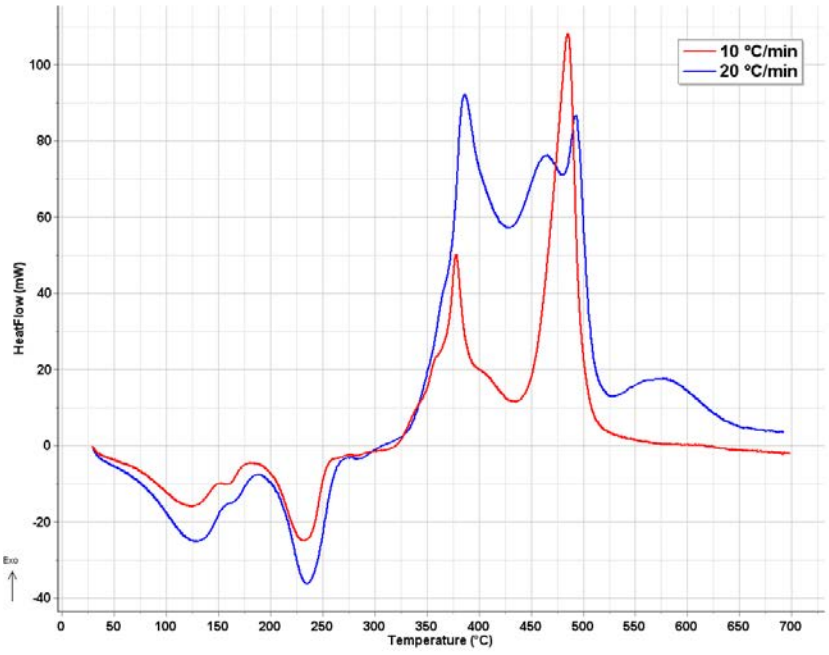
c) DTG of compound **1a** in air



d) DTG of compound **1b** in air



e) DSC of compound **1a** in air



f) DSC of compound **1b** in air