

Titre: Quantification of the chemical reactivity of molten nitrate salts with heat treatable aluminum alloys. Supplément
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Supplementary Material

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Figure S6	DSC/TG/FTIR/MS analyses of the 50/50 %mass Alloy AW257 + NaNO ₃ sample

Conditions and Sample	sample weight / mg	%composition / alloy:nitrate	DSC or SDT Observation
<i>DSC Closed capsules / 316L Crucible</i> <i>Tmax. : 700 °C</i>			
LiNO ₃	21.4116	0 / 100	melting
NaNO ₃	3.1269	0 / 100	melting
AW257	7.1952	100 / 0	melting
2198	9.3854	100 / 0	melting
1050	30.3042	100 / 0	melting
6156	15.5605	100 / 0	melting
2024	12.9522	100 / 0	melting
Fe	27.1335	100 / 0	melting
Al-12%Mg	16.5701	100 / 0	melting
AW257 + NaNO ₃	11.2188	53 / 47	melting+ small exothermic event prior to melting
2198 + NaNO ₃	29.8007	52 / 48	melting
1050 + NaNO ₃	27.9754	50 / 50	melting
6156 + NaNO ₃	29.3390	52 / 48	melting
2024 + NaNO ₃	29.1649	49 / 51	melting
Fe + NaNO ₃	28.4384	50 / 50	melting+small exothermic reaction
Al-12%Mg + NaNO ₃	20.6569	49 / 51	Small exotherm (oxidation) at about 465°C
<i>DSC open / pre-annealed Al₂O₃ crucible</i> <i>Tmax : 710 °C</i>			
AW257	33.7	100 / 0	melting
2198	44.6	100 / 0	melting
1050	34.4	100 / 0	melting
6156	38.2	100 / 0	melting
2024	31.1	100 / 0	melting
<i>SDT open capsules / INCONEL 625 Crucible</i> <i>Tmax. : 1000 °C</i>			
LiNO ₃	21.4116	0 / 100	melting + thermal decomposition
NaNO ₃	23.5900	0 / 100	melting + thermal decomposition
LiNO ₃ + NaNO ₃	8.7872	49 / 51	melting + thermal decomposition
2024 + NaNO ₃	24.6440	50 / 50	$\Delta h > 1000 \text{ J / g}^{-1}$
2198 + NaNO ₃	14.9664	50 / 50	Ignition
AW 257 + NaNO ₃	8.8553	49 / 51	Ignition
Al-12%Mg + NaNO ₃	29.5656	50 / 50	Ignition
A-20%Mg + NaNO ₃	5.6704	49 / 51	Exotherm at eutectic reaction (450 °C, ~2700 J/g) followed by high temperature exotherm (730 °C, ~1400 J/g)
Al-5%Li+ NaNO ₃	9.5820	51 / 49	Ignition

Table S1: Samples studied in DSC experiments and observed reactions

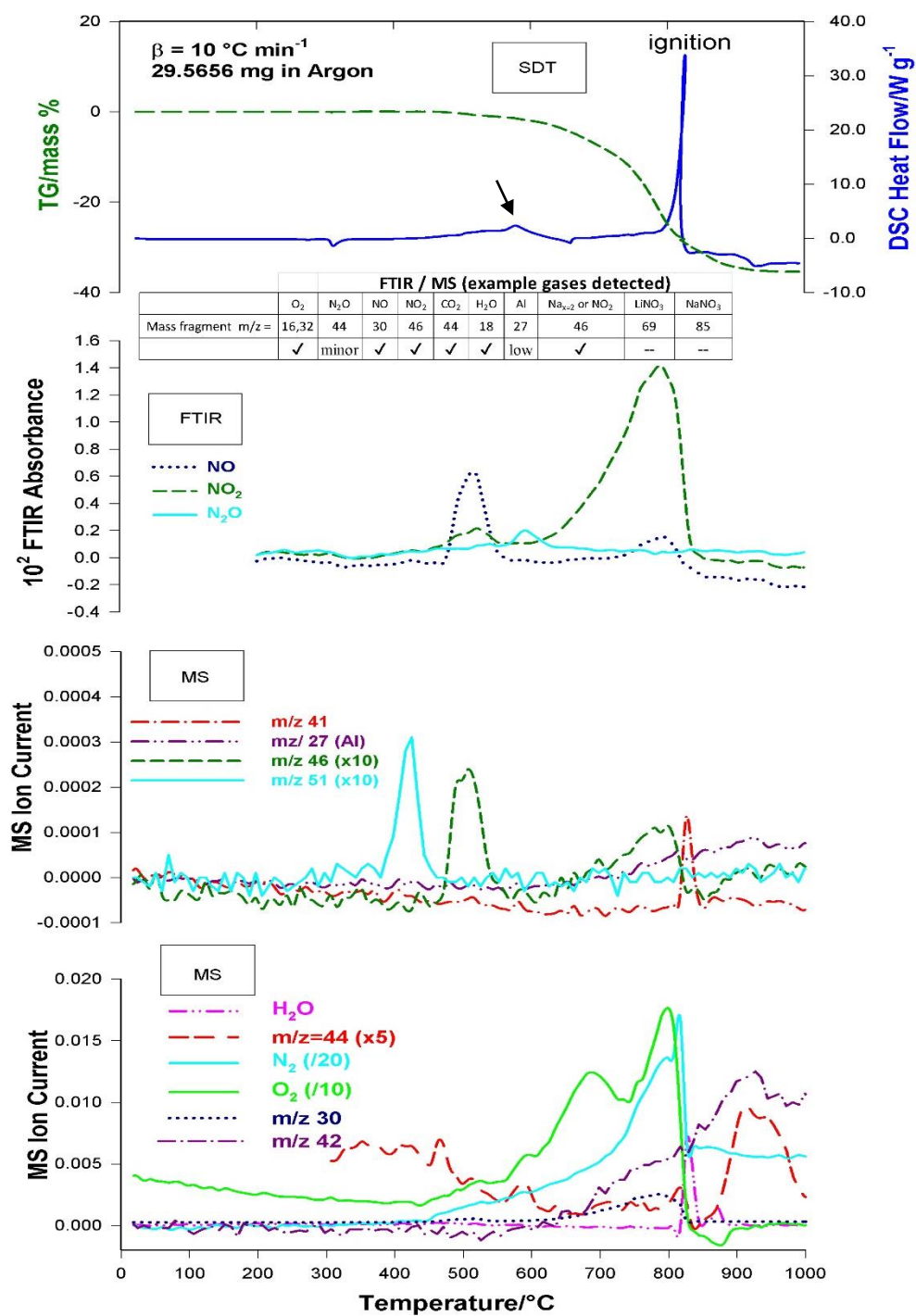


Figure S1: DSC/TG/FTIR/MS analyses of the 50/50 %mass Al-12%Mg + NaNO₃ sample.

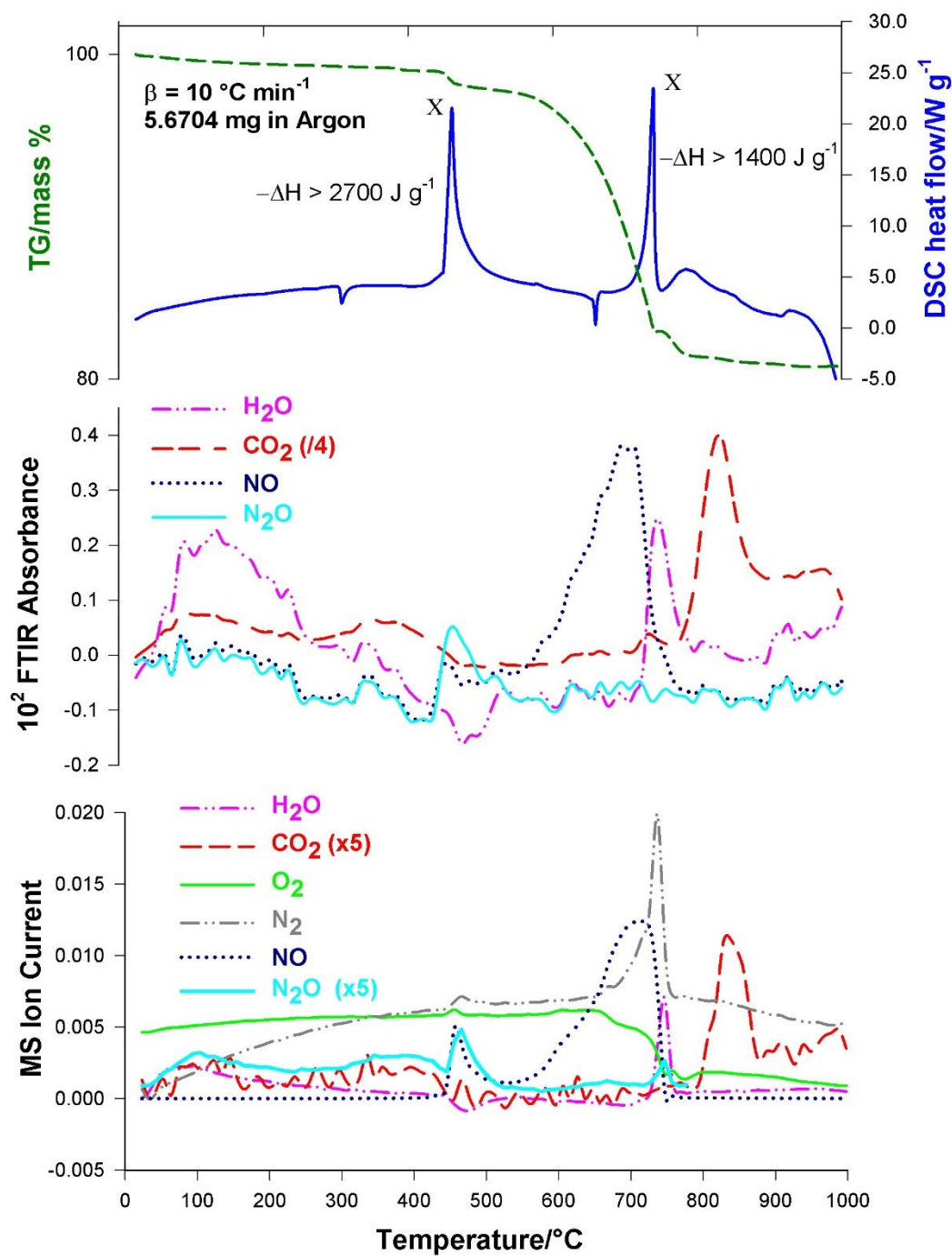


Figure S2: DSC/TG/FTIR/MS analyses of the 50/50 %mass Al-20%Mg + NaNO₃ sample. X's mark low temperature exothermic reaction (-2700 J/g) before alloy melt, and high temperature exotherm (-1400 J/g).after alloy melt

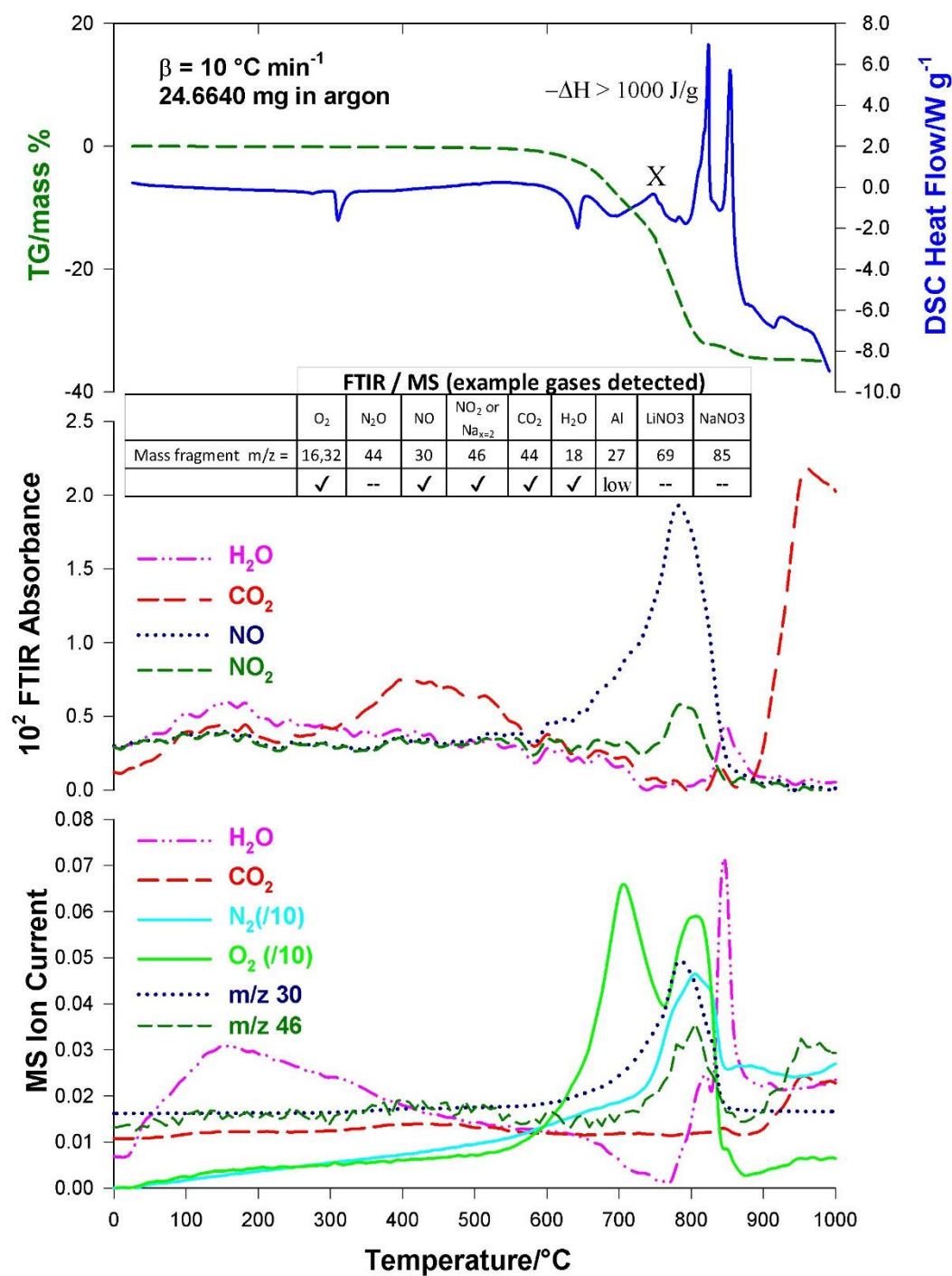


Figure S3: DSC/TG/FTIR/MS analyses of the 50/50 %mass Alloy 2024 + NaNO₃ sample. X marks small exothermic reaction.

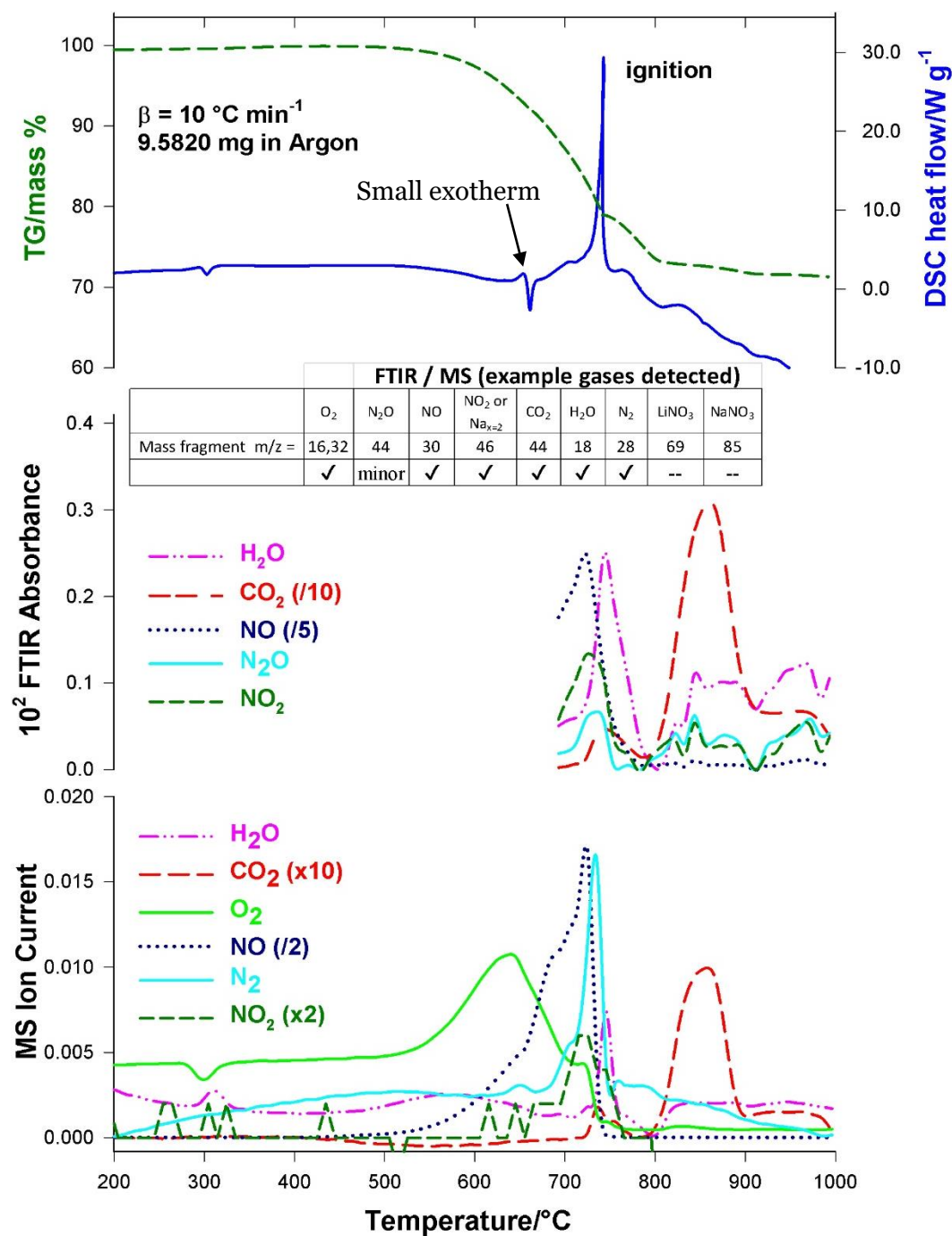


Figure S4: DSC/TG/FTIR/MS analyses of the 50/50 %mass Al-5%Li + NaNO₃ sample (FTIR data capture start ca. 650 °C).

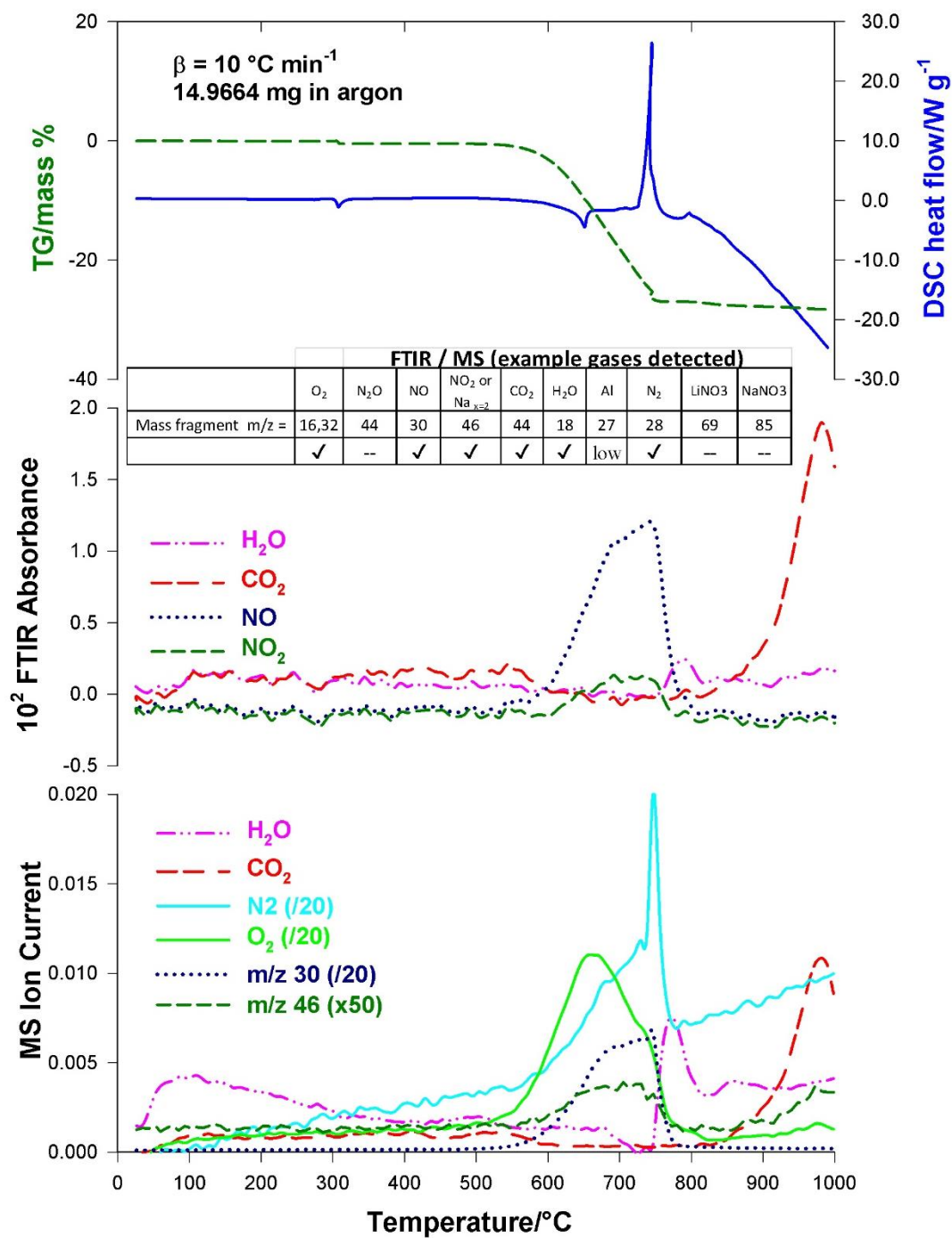


Figure S5: DSC/TG/FTIR/MS analyses of the 50/50 %mass Alloy 2198 + NaNO₃ sample.

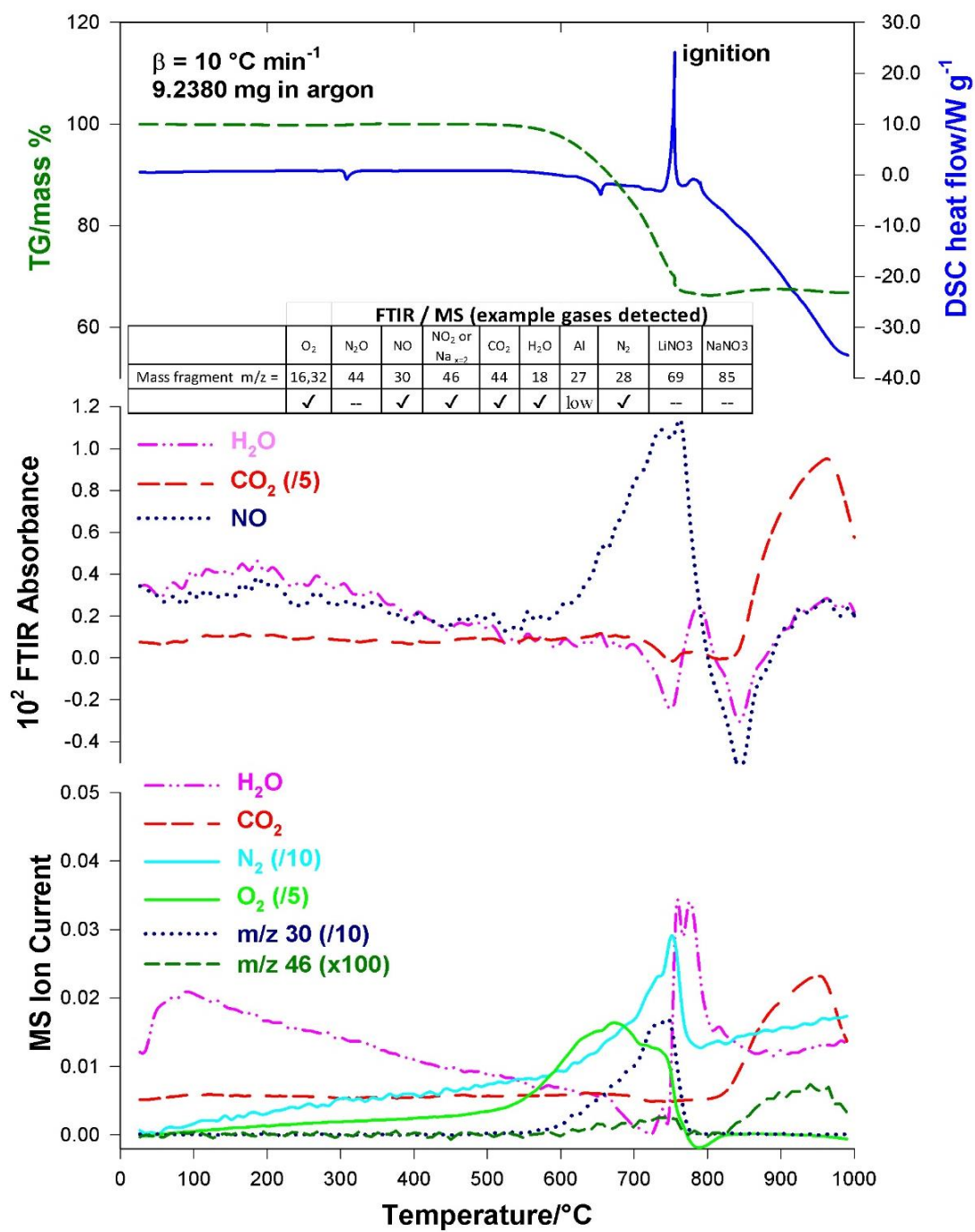


Figure S6: DSC/TG/FTIR/MS analyses of the 50/50 %mass Alloy AW257 + NaNO₃ sample