

### Electronic Supplementary Information

Figure S1 – XRD of the samples: Mo12 after sintering (before etching), and Mo12Na after etching in 10M NaOH for 10 days (A); Mo6Al<sub>micro</sub> after sintering (before etching), and Mo6Al<sub>micro</sub>NaT70 after etching in 10M NaOH for 15 days at 70 °C (B); Al nano powder.

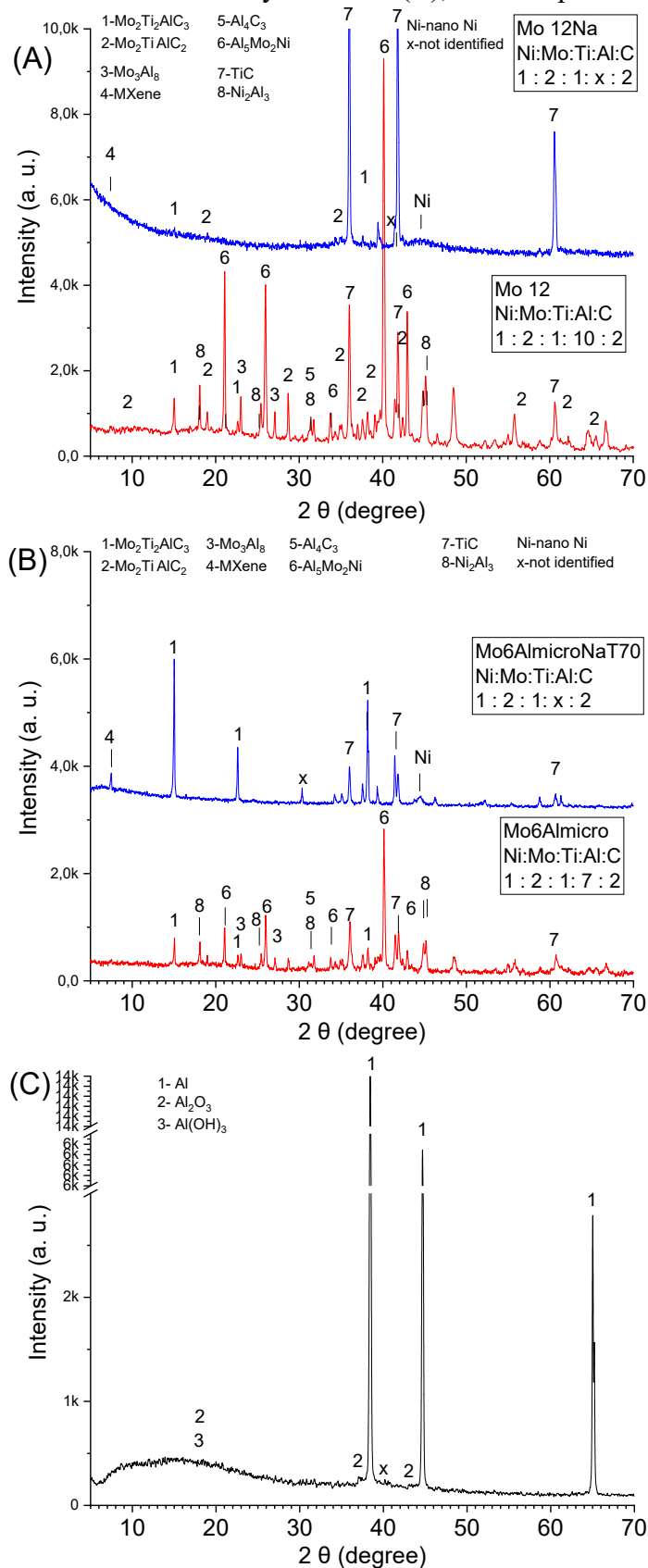


Figure S2 – SEM images of the surface layer of sample Mo6 after sintering (A, B, C, D).

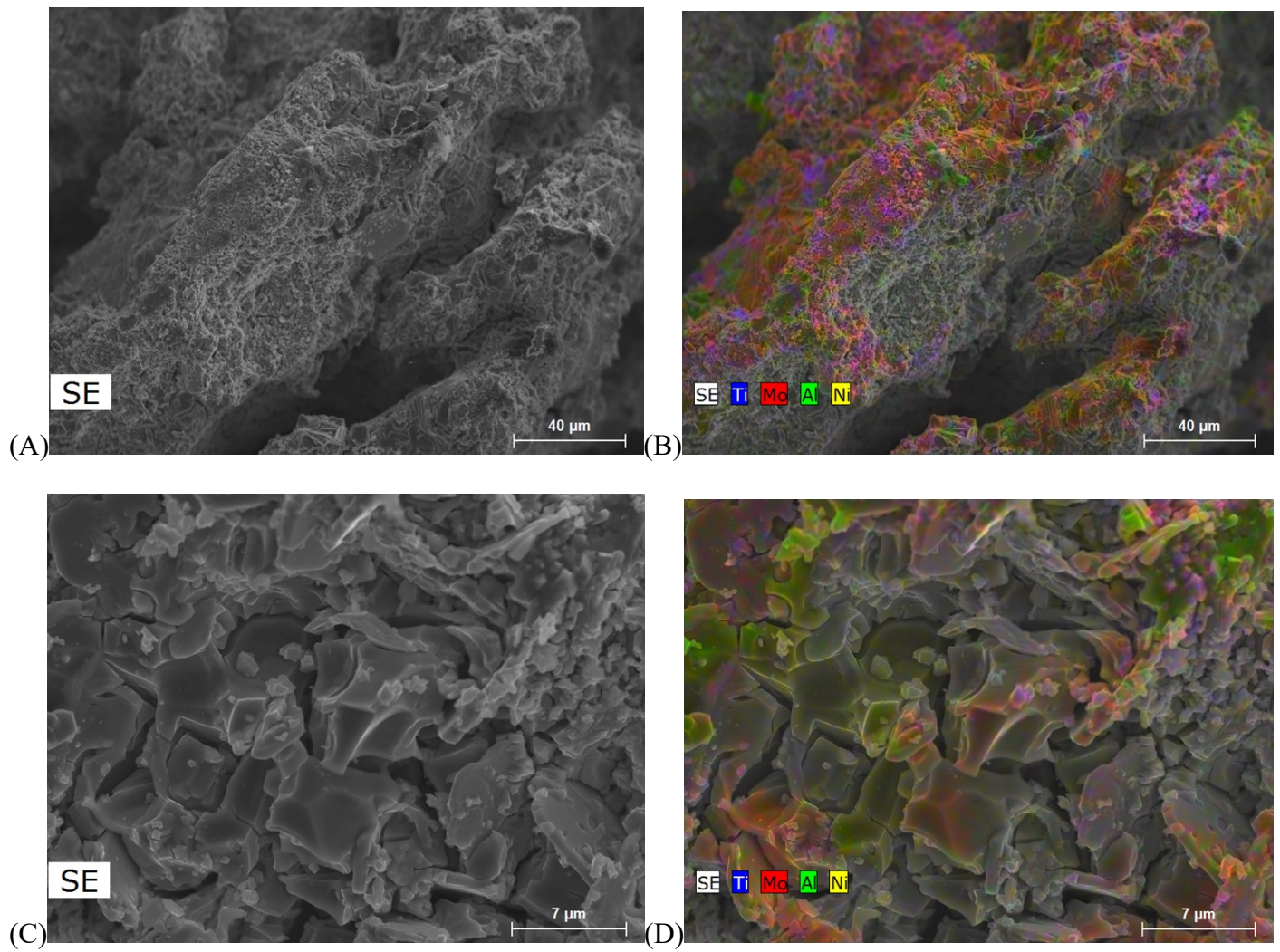


Figure S3 – EDS spectrum of sample Mo5 after sintering. The analysis was performed for the are shown by mapping image.

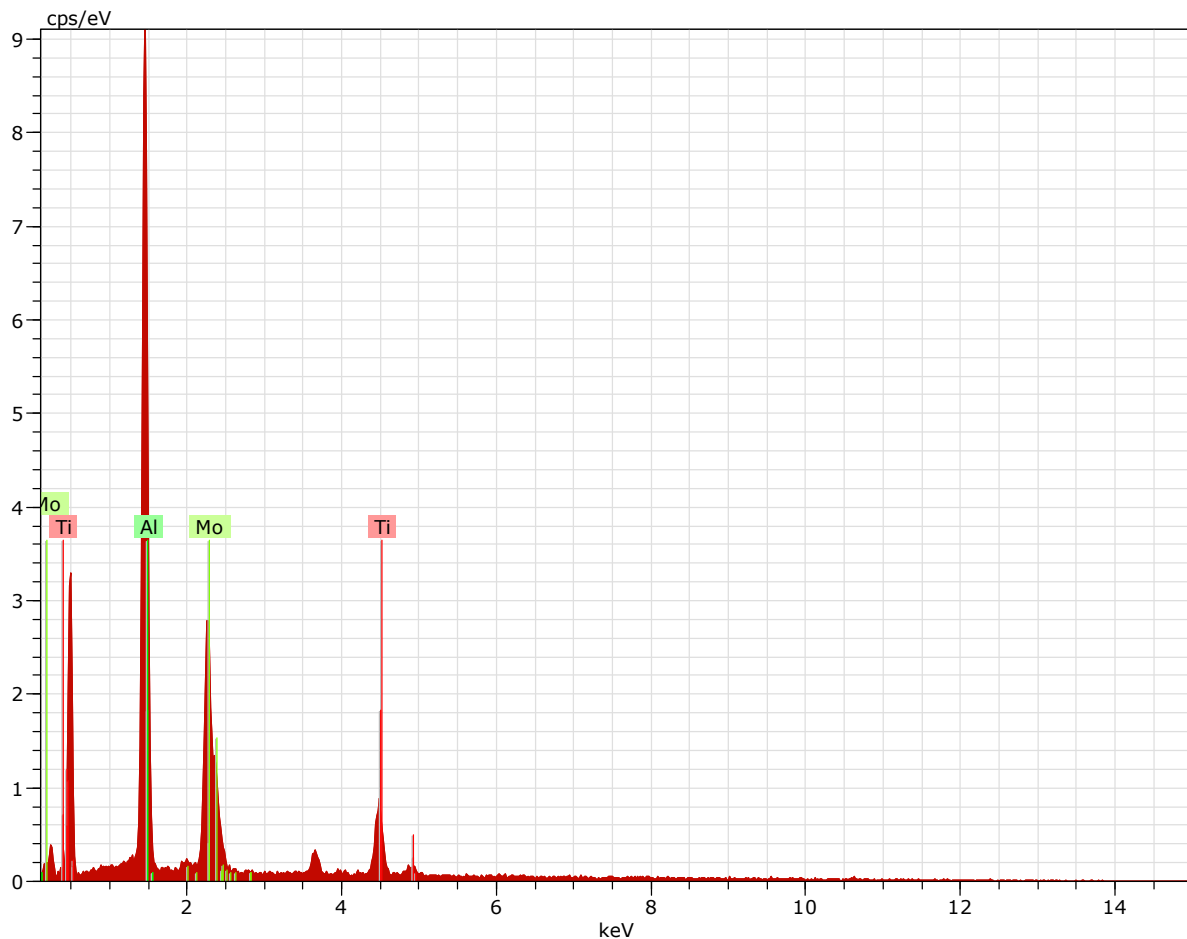


Table S1 – Quantitative results of the EDS analysis of sample Mo5 after sintering.

Element	Series	unn. [wt.%]	C norm. [wt.%]	C Atom. [at.%]	C Error (3 Sigma) [wt.%]
Titanium	K-series	9.40	16.46	15.08	1.10
Aluminium	K-series	22.85	40.02	65.04	3.33
Molybdenum	L-series	24.84	43.51	19.89	2.84

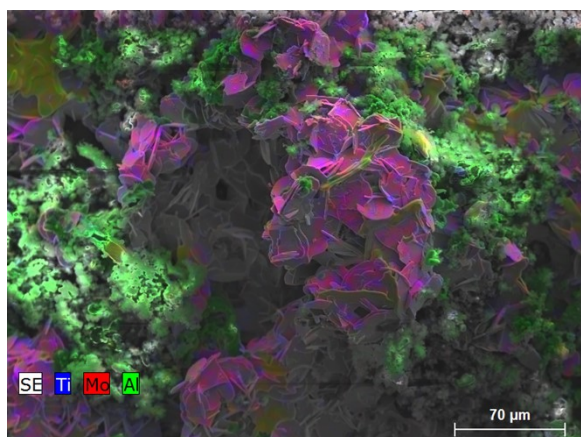


Figure S4 – EDS spectrum of sample Mo5Na after sintering and etching in 10M NaOH.

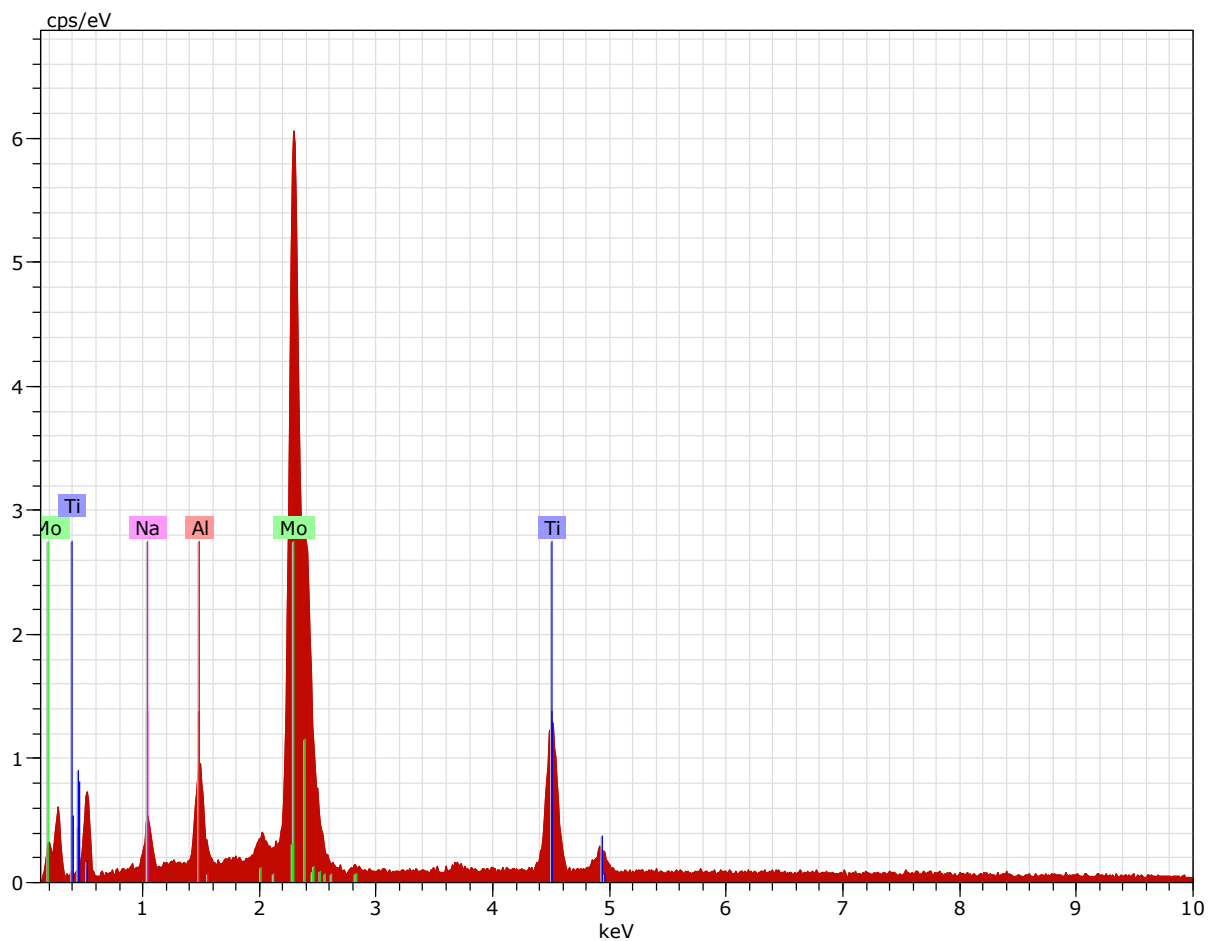


Table S2 – Quantitative results of EDS analysis of sample Mo5Na after sintering and etching in 10M NaOH. SEM image shows the analysed area.

Element	Series	unn. [wt.%]	C norm. [wt.%]	C Atom. [at.%]	C Error (3 Sigma) [wt.%]
Aluminium	K-series	2.10	3.02	7.89	0.41
Molybdenum	L-series	50.78	72.89	53.62	5.47
Titanium	K-series	15.48	22.22	32.76	1.52
Sodium	K-series	1.30	1.87	5.74	0.38

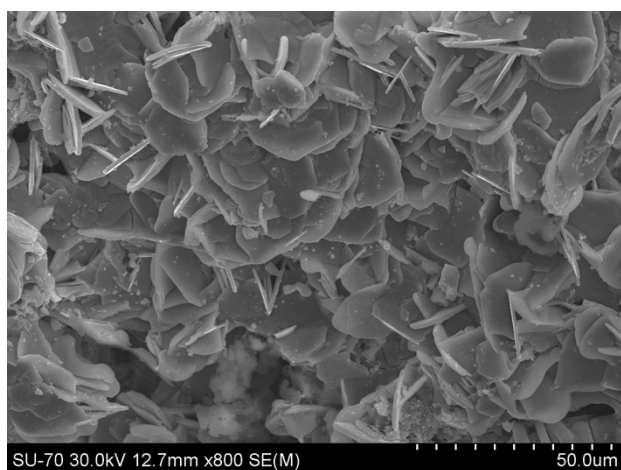


Figure S5 – EDS spectrum of sample Mo6 after sintering.

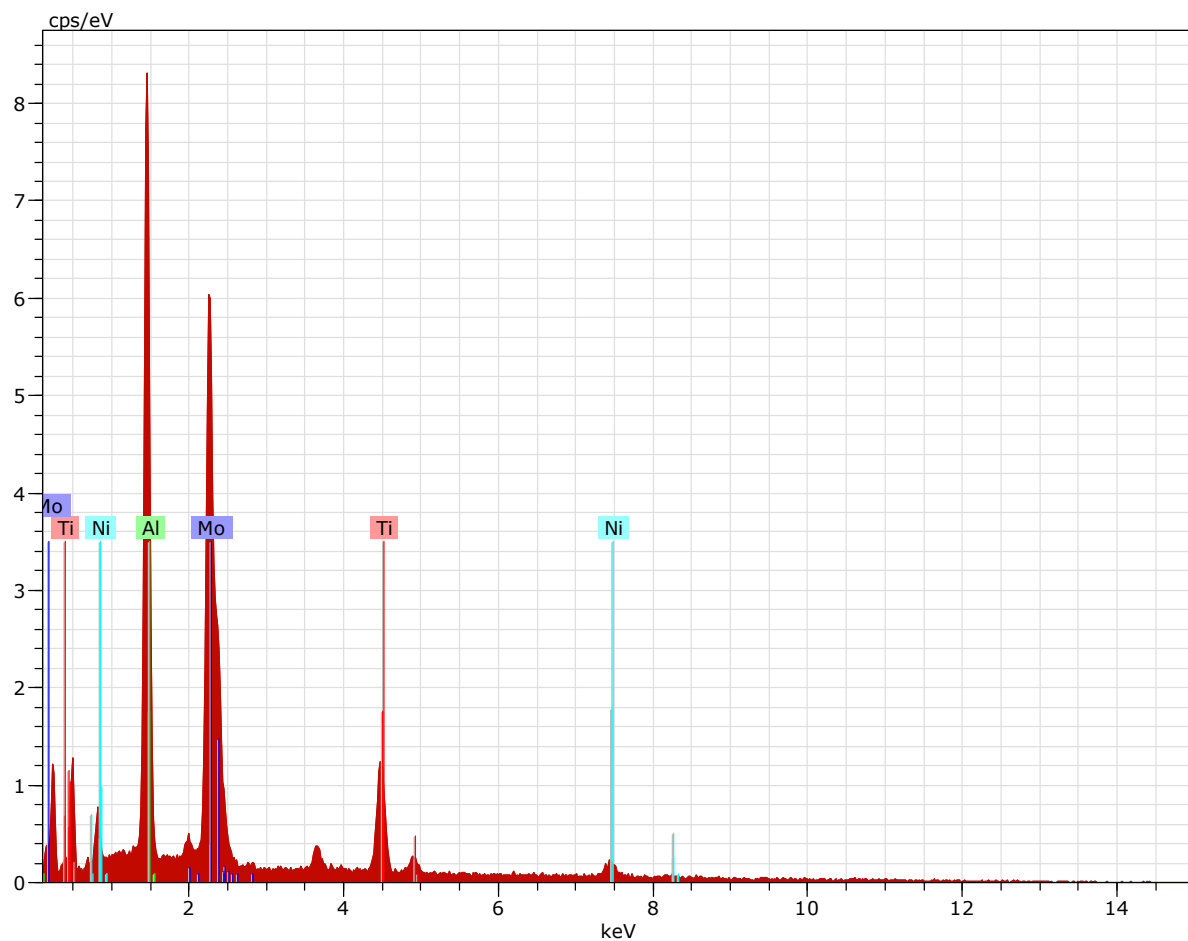


Table S3 – Quantitative results of EDS analysis of sample Mo6 after sintering.

Element	Series	unn. [wt.%]	C norm. [wt.%]	C Atom. [at.%]	C Error (3 Sigma) [wt.%]
Titanium	K-series	10.50	14.50	16.20	1.14
Aluminium	K-series	16.90	23.34	46.29	2.49
Molybdenum	L-series	39.23	54.18	30.22	4.30
Nickel	K-series	5.78	7.99	7.28	0.94

Figure S6 – EDS spectrum of sample Mo6Na after sintering and etching in 10M NaOH.

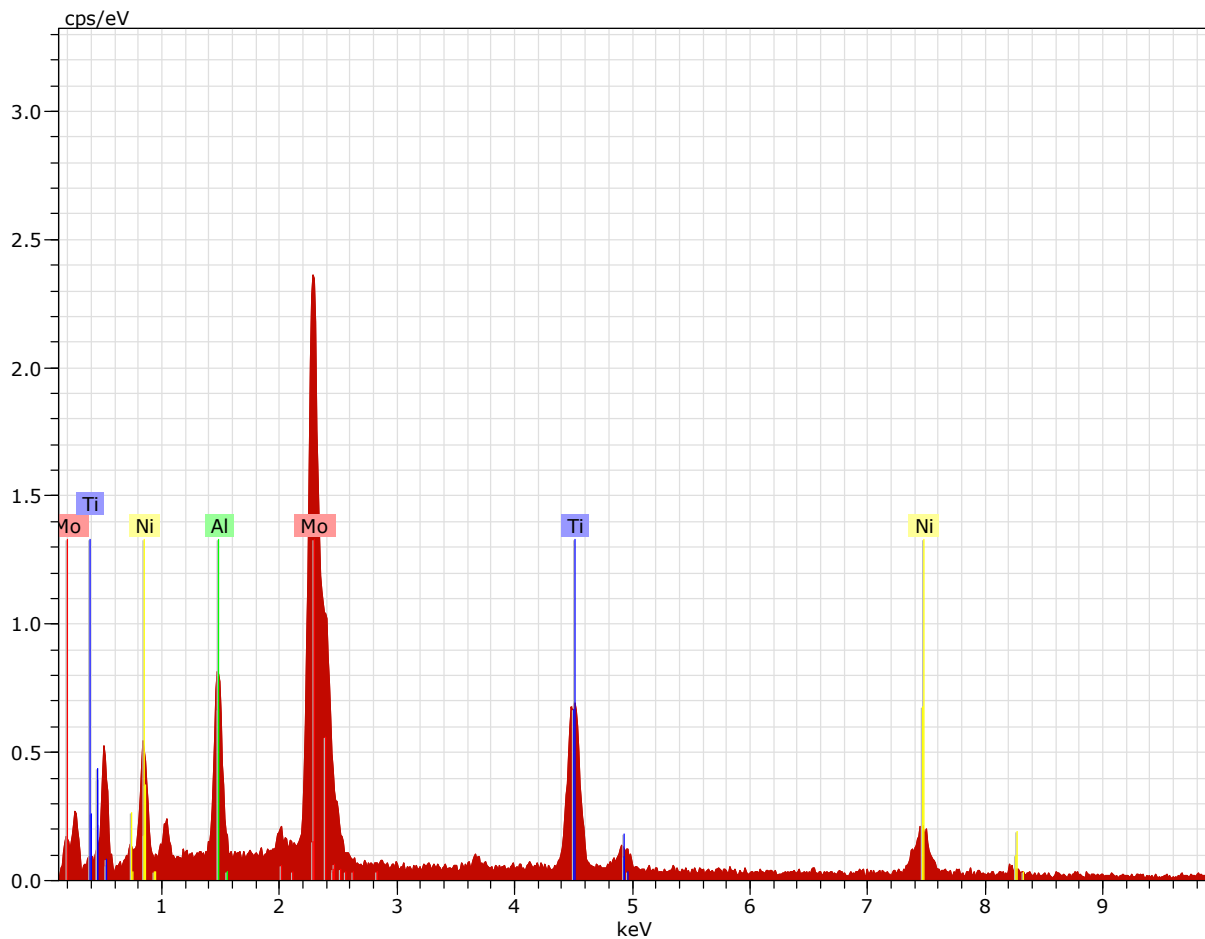


Table S4 – Quantitative results of EDS analysis of sample Mo6Na after sintering and etching in 10M NaOH.

El	AN	Series	unn. [wt.%]	C norm. [wt.%]	C Atom. [at.%]	C Error (1 Sigma) [wt.%]
Mo	42	L-series	44.95	50.83	33.56	1.65
Ti	22	K-series	18.70	21.14	27.97	0.64
Ni	28	K-series	19.06	21.55	23.26	0.79
Al	13	K-series	5.73	6.48	15.22	0.33

Figure S7 – CV curve of electrode Mo6Na after 4 days electrolysis at scan rate of 1 mVs<sup>-1</sup>.

