Supplementary Materials

Interactive list of figures and tables in supplementary materials:

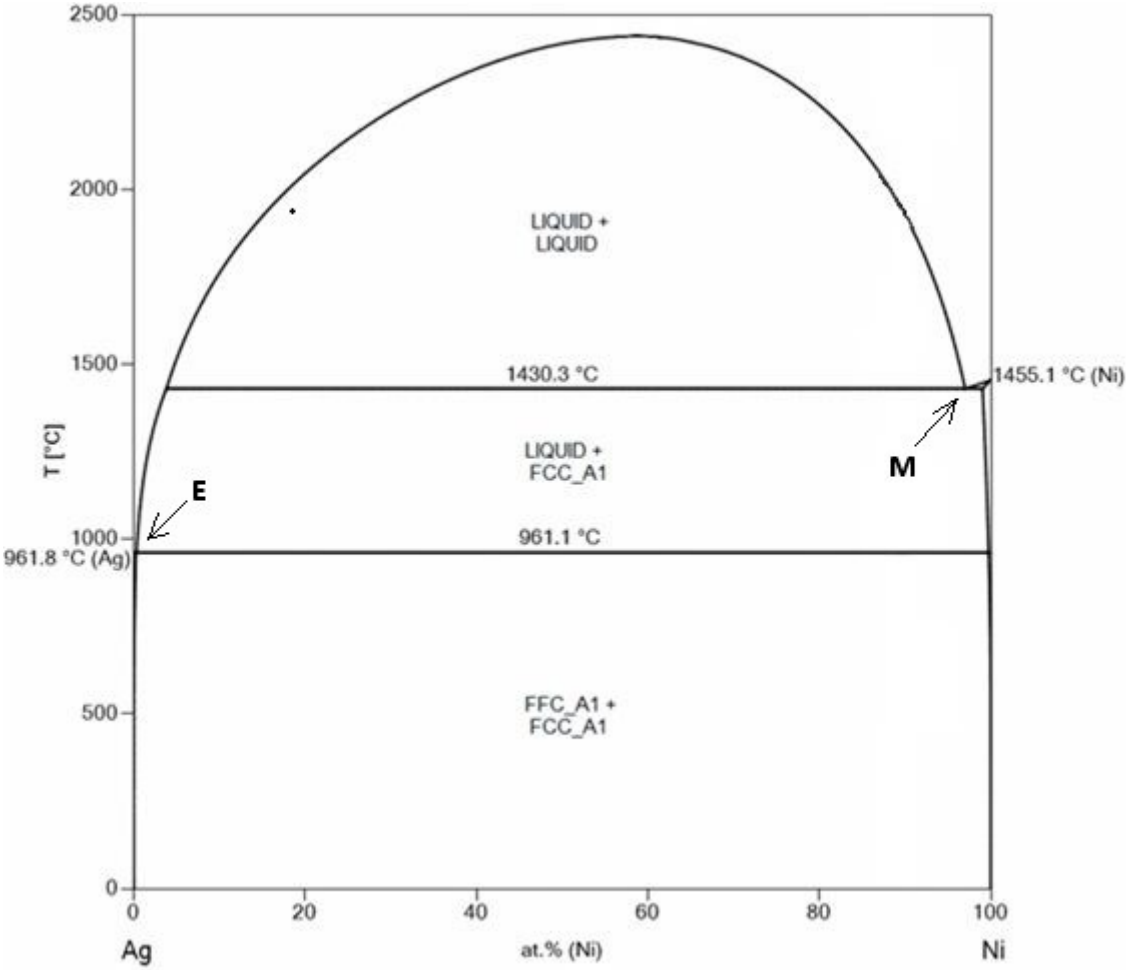

Fig. S 1: Calculated phase diagram of the Ag-Ni system. M…monotectic invariant reaction, E…eutectic invariant reaction. Ref.: Kroupa, A.; Dinsdale, A.; Watson, A.; Vřešťál, J.; Vizdal, J.; Zemanova, A. The Development of the COST 531 Lead-Free Solders Thermodynamic Database. *JOM* 2007, *59*, 20–25. https://doi.org/10.1007/s11837-007-0084-6.

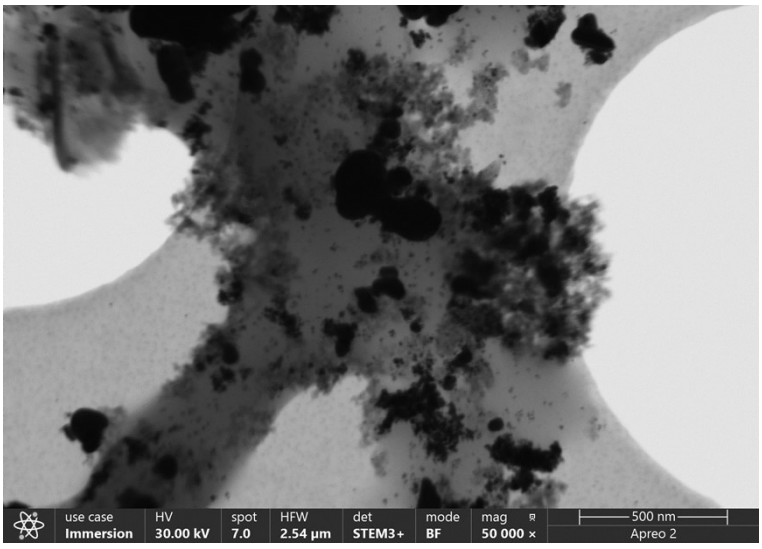

Fig. S 2: STEM image of Ag NPs.

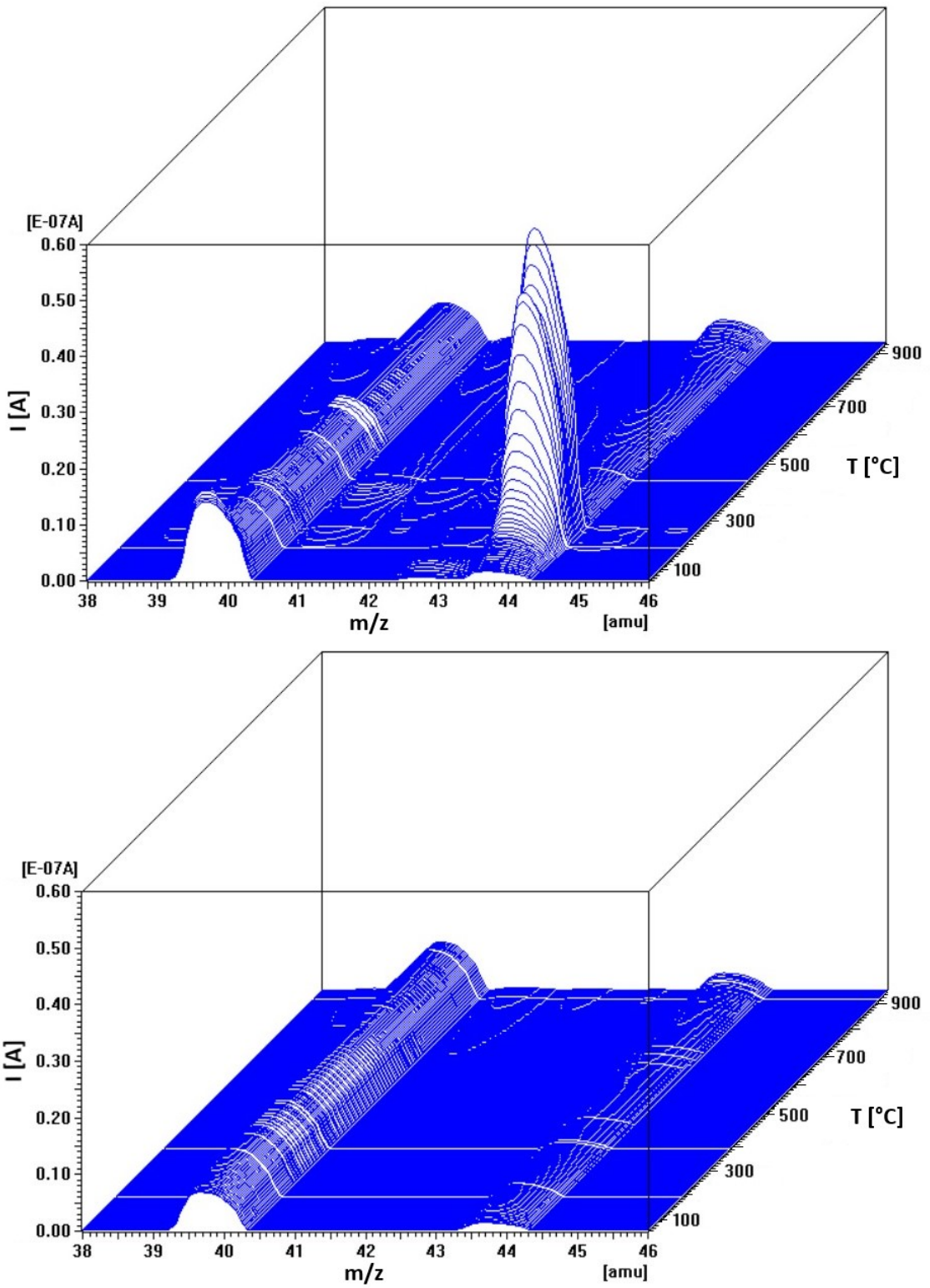

Fig. S 3: Mass spectrum of $Ag_{34.5}$ $Ni_{65.5}$ nanoparticles in the m/z range 38–46 (top: sample spectrum; bottom: background). The peak at m/z = 40 corresponds to residual argon, while the peak at m/z = 44 indicates CO_2 evolution.

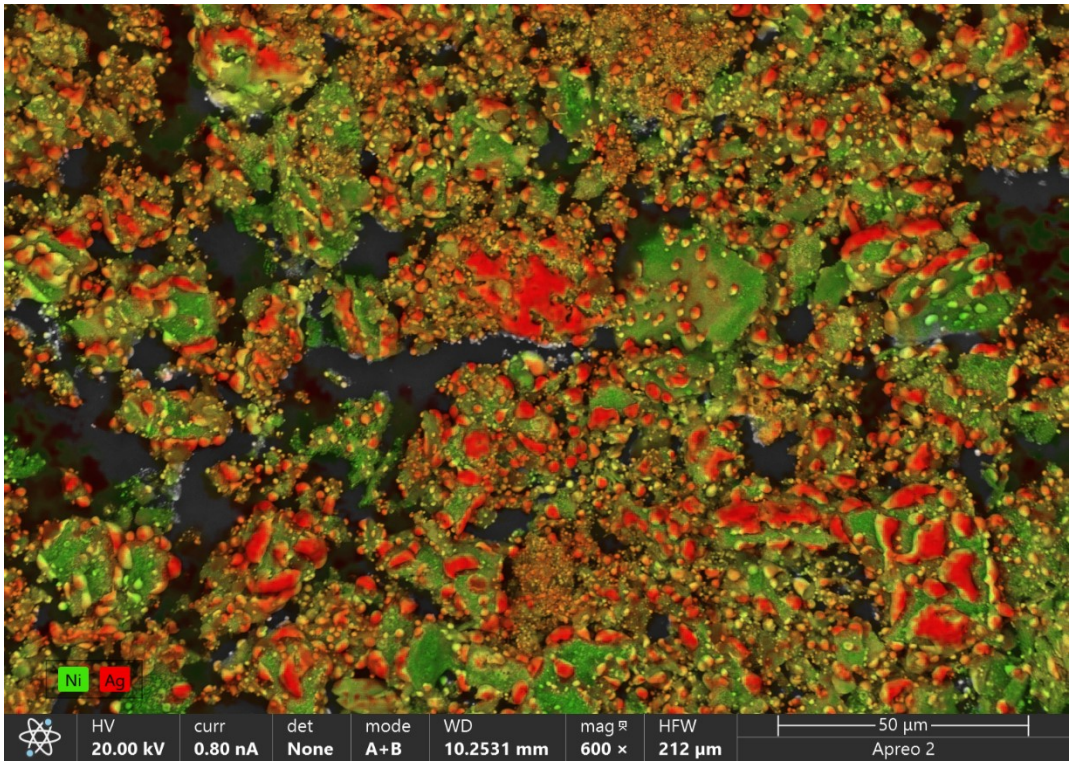

Fig. S 4: EDS analysis of the $Ag_{62}Ni_{38}$ sample showing the distribution of both elements

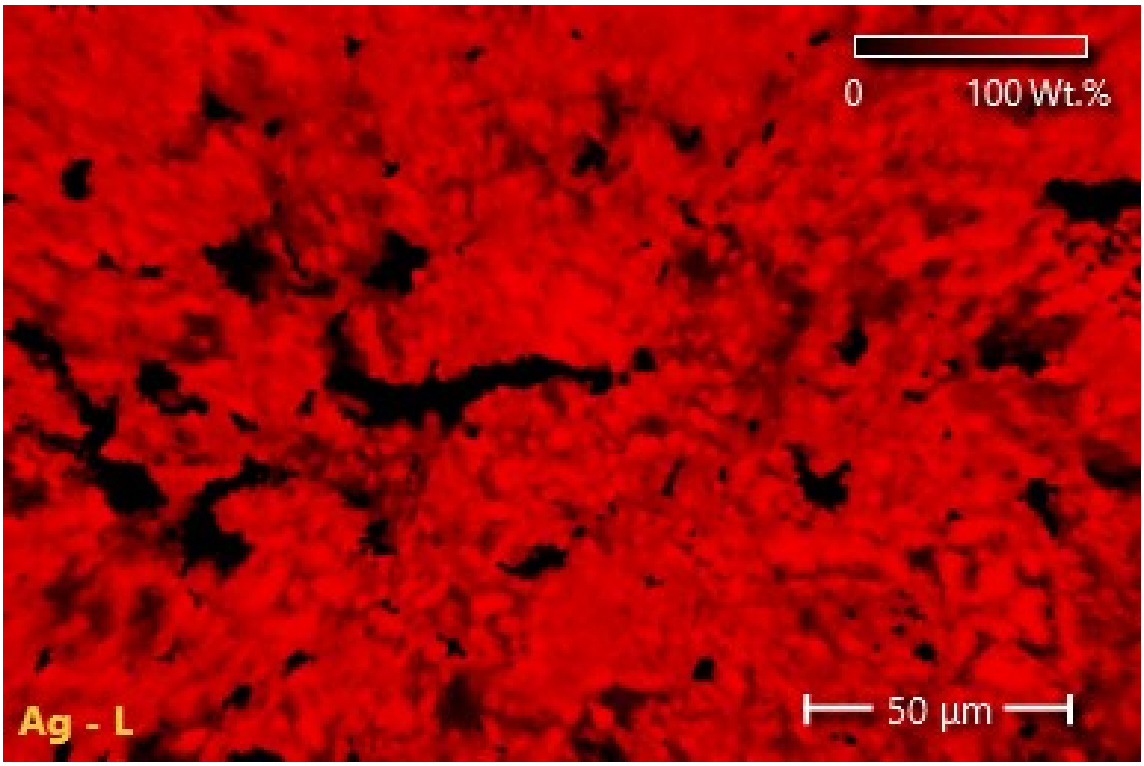

Fig. S 5: EDS analysis of the $Ag_{62}Ni_{38}$ sample showing the spatial distribution of silver.

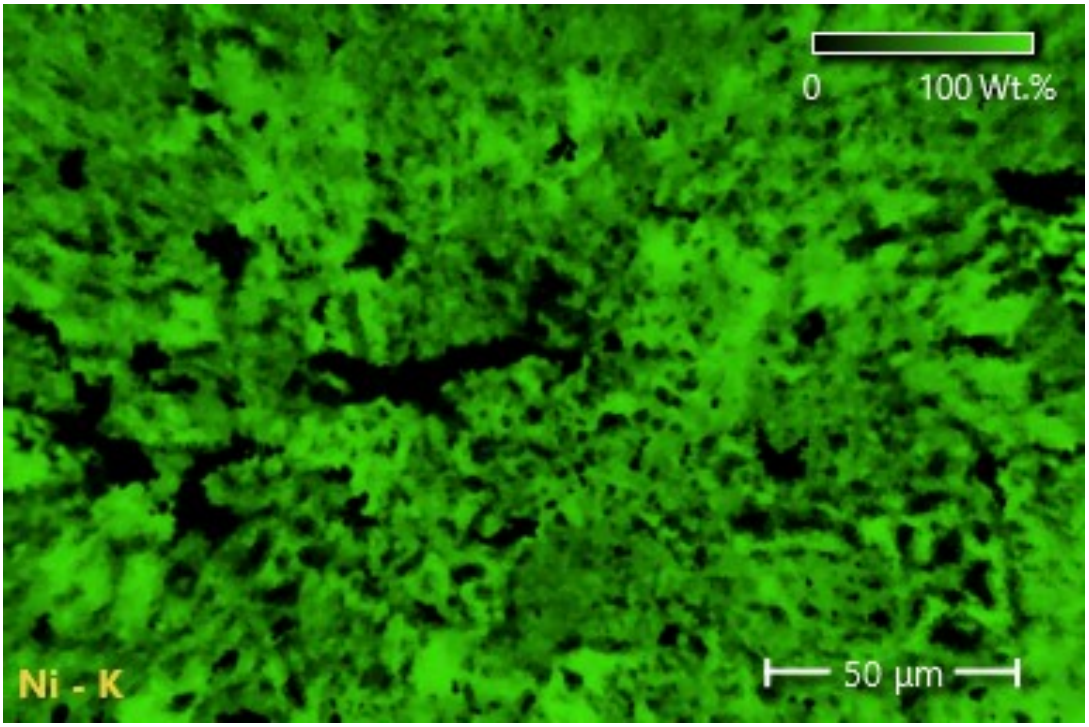

Fig. S 6: EDS analysis of the $Ag_{62}Ni_{38}$ sample showing the spatial distribution of nickel.

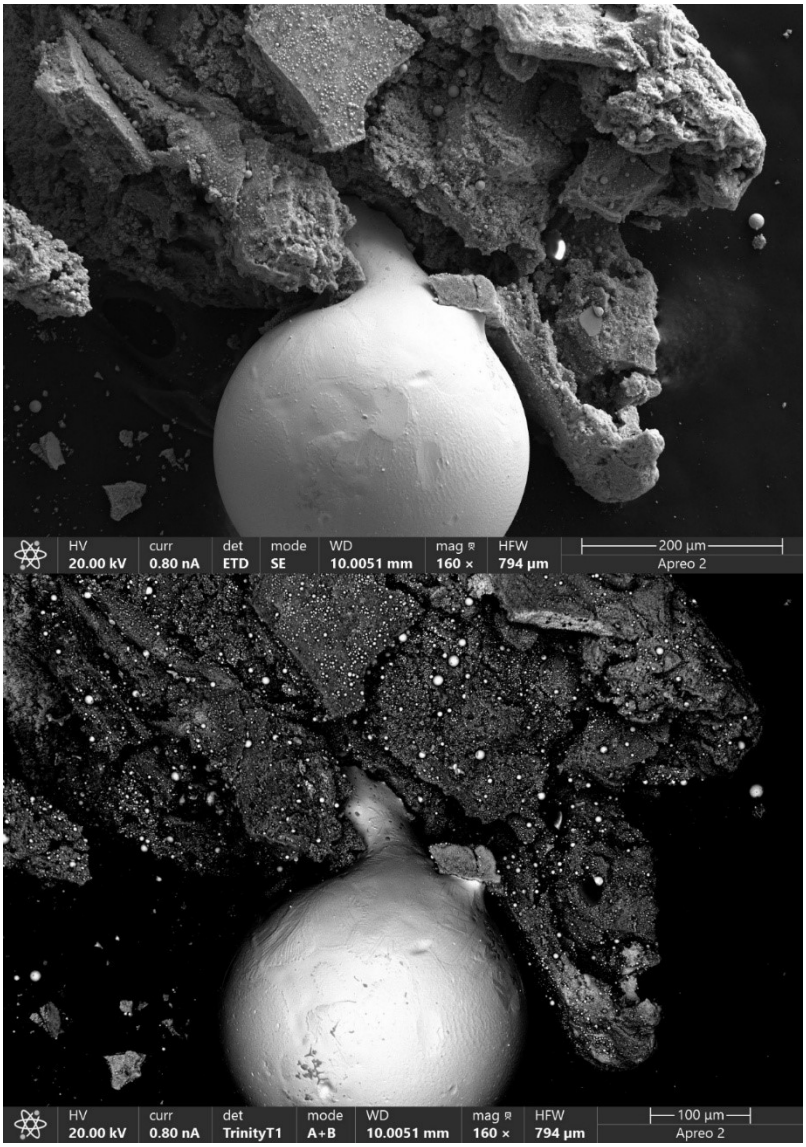

Fig. S 7: SEM image of sample $Ag_{51}Ni_{49}$ after the DSC analysis (top - ETD detector, bottom - CBS detector).

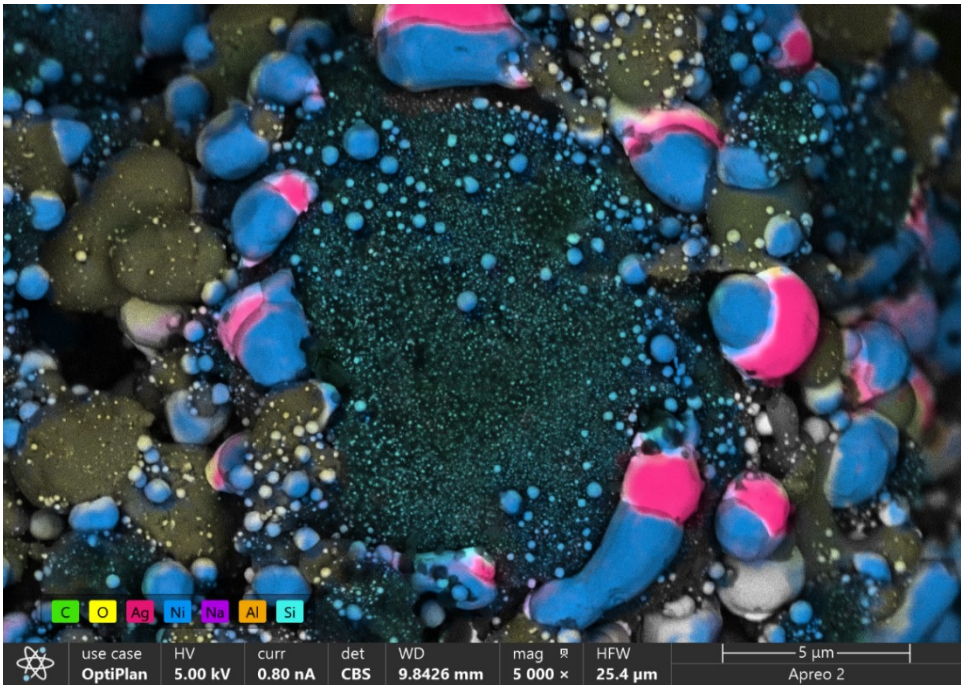

Fig. S 8: EDS analysis of the Ag_9Ni_{91} sample showing the distribution of both elements.

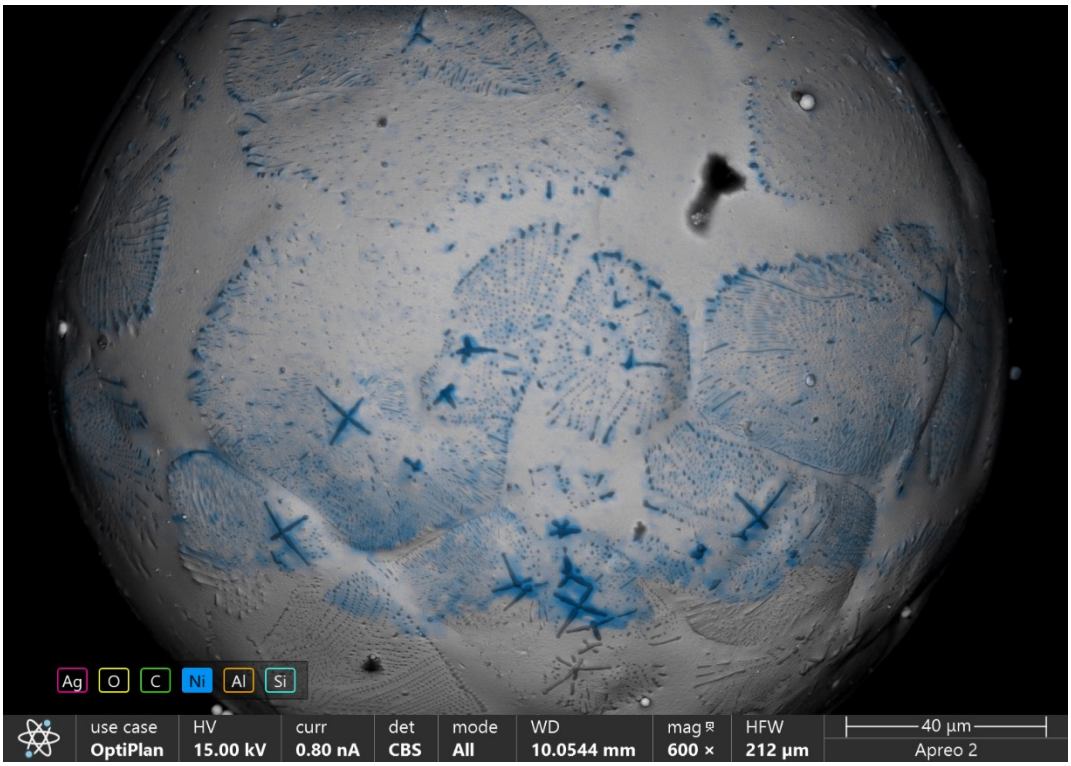

Fig. S 9: EDS analysis of the $Ag_{86}Ni_{14}$ sample showing the spatial distribution of nickel

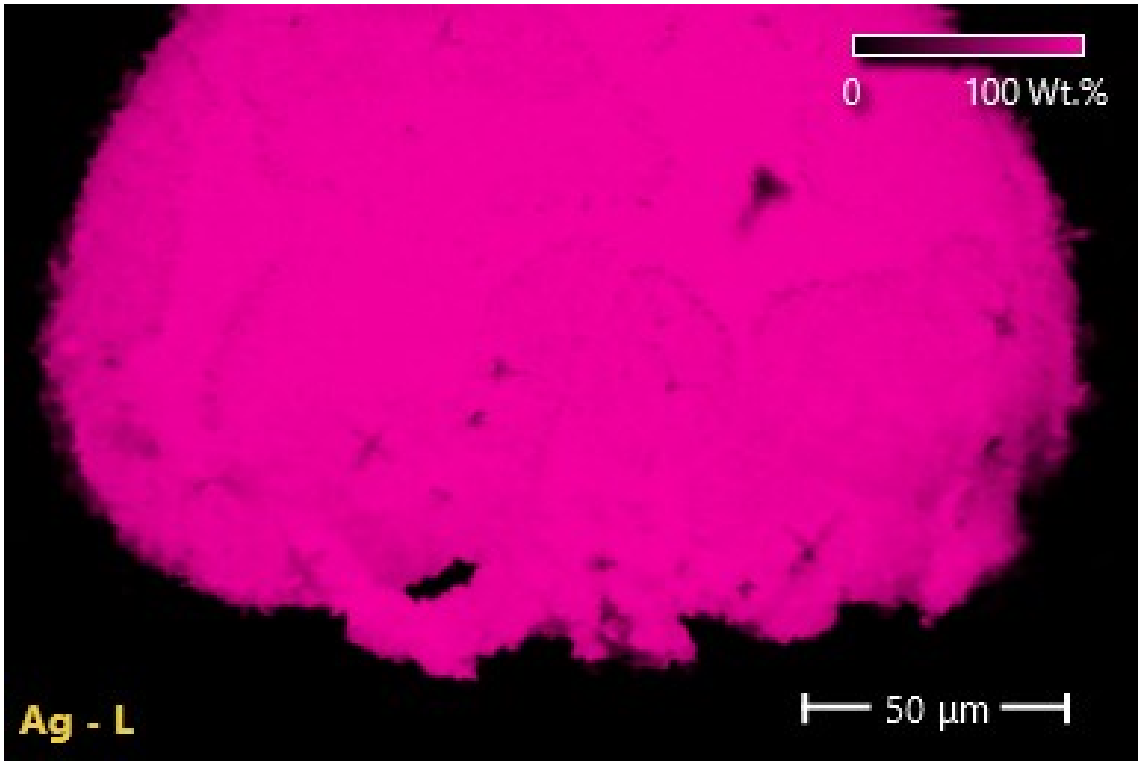

Fig. S 10: EDS analysis of the $Ag_{86}Ni_{14}$ sample showing the spatial distribution of silver.

Table S 1: Sample weight before and after the KEMS analysis.

Sample	Weight [mg]		Mass loss [%]
	Before KEMS	After KEMS	
Ni	5.0	4.6	8.0
Ag_9Ni_{91}	4.0	3.5	12.5
$Ag_{29}Ni_{71}$	4.4	2.1	52.3
$Ag_{35}Ni_{65}$	4.1	3.1	24.4
$Ag_{45}Ni_{55}$	4.5	3.4	24.4
$Ag_{62}Ni_{38}$	4.9	3.5	28.6
$Ag_{73}Ni_{27}$	4.4	3.1	29.5
$Ag_{94}Ni_6$	4.4	3.4	22.7
Ag	4.9	4.6	6.1

Table S 2: The results obtained by means of XPS analysis on sample $Ag_{94}Ni_6$.

Sample	Name	Position (eV)	Raw Area	Area/(RSF*T*MFP)
Radiation shield with deposit	Na 1s	1071.57	2139.69	105.124
	C-C(H)	284.8	8125.15	3821.44
	C-O	286.18	726.827	341.999
	C=O	288.2	495.243	233.182
	Si 2p	102.11	234.26	139.731
	Al 2p	73.97	1429.15	1311.4
	O 1s	531.02	14407.2	238.628
	Ag 3d 5/2	368.25	10922.4	283.272
	Ag 3d 3/2	374.25	7338.2	190.139
Original radiation shield	Na 1s	1071.93	981.779	48.2269
	C-C(H)	284.8	5561.63	2615.76
	C-O	286.3	322.801	151.9
	C=O	288.42	343.39	161.694
	Si 2p	101.98	521.436	311.036
	Al 2p	73.71	3489.72	3202.46

Table S 3: Sample weight before and after the DSC analysis.

Sample	Weight [mg]		Mass loss [%]
	Before DSC	After DSC	
Ag_9Ni_{91}	24.6	20.0	18.7
$Ag_{51}Ni_{49}$	16.1	11.9	26.1
$Ag_{86}Ni_{14}$	14.3	13.1	8.4