Electronic Supplementary Information

An efficient nickel oxides/nickel structure for water oxidation: A new strategy

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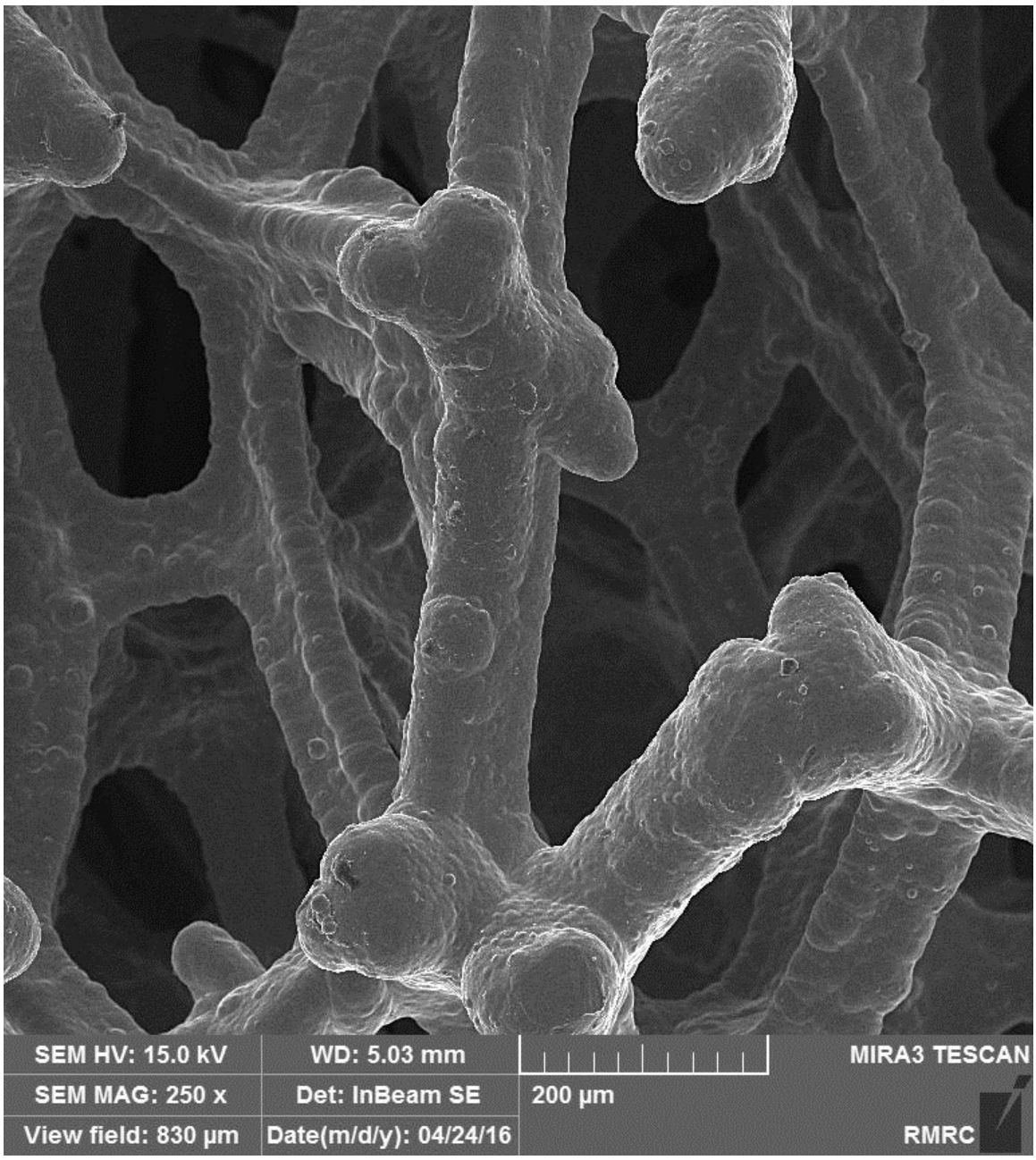

Fig. S1 SEM image from pure Ni foam (Scale bar 200 µm).

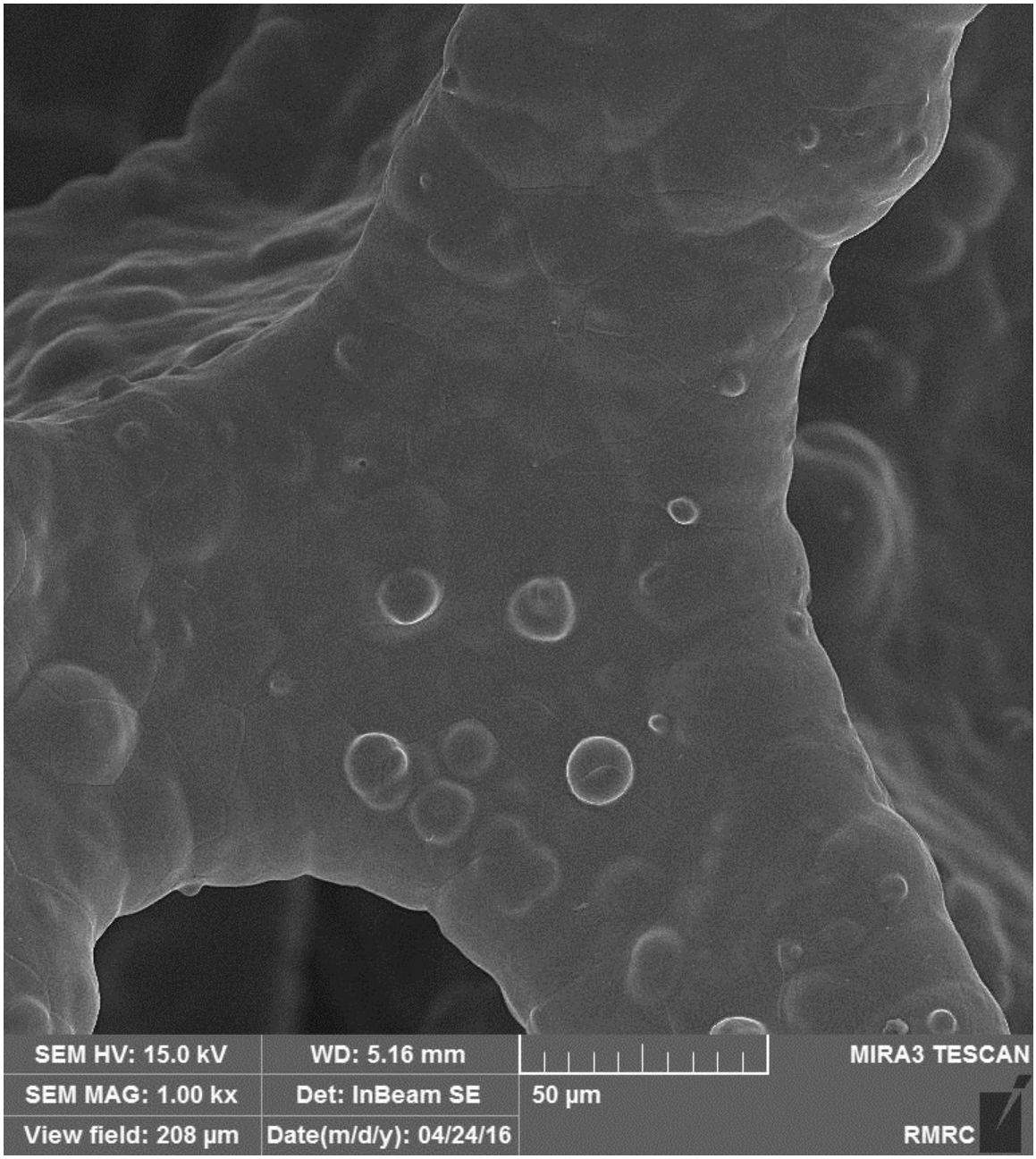

Fig. S2 SEM image from pure Ni foam (Scale bar 50 µm).

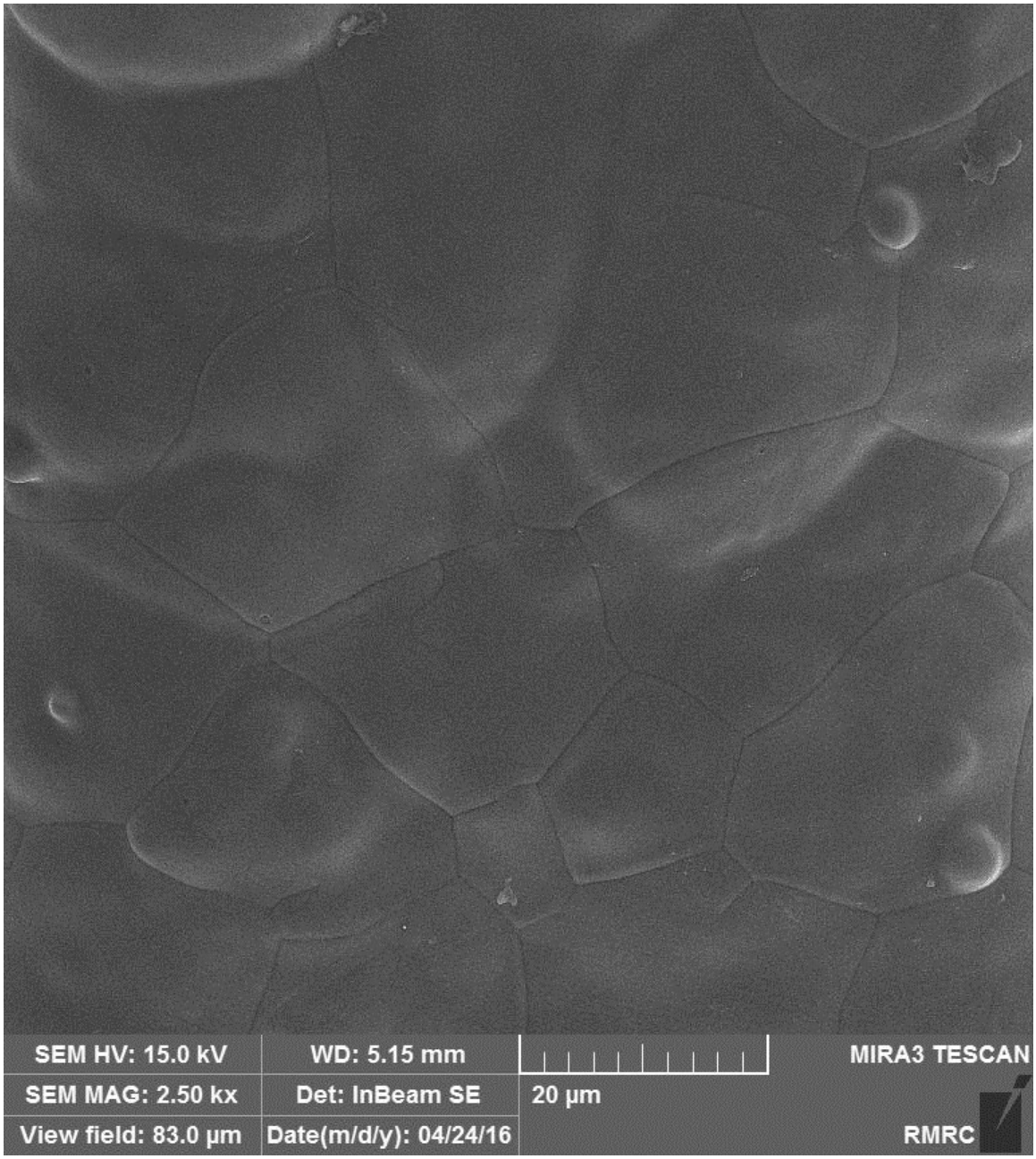

Fig. S3 SEM image from pure Ni foam (Scale bar 20 µm).

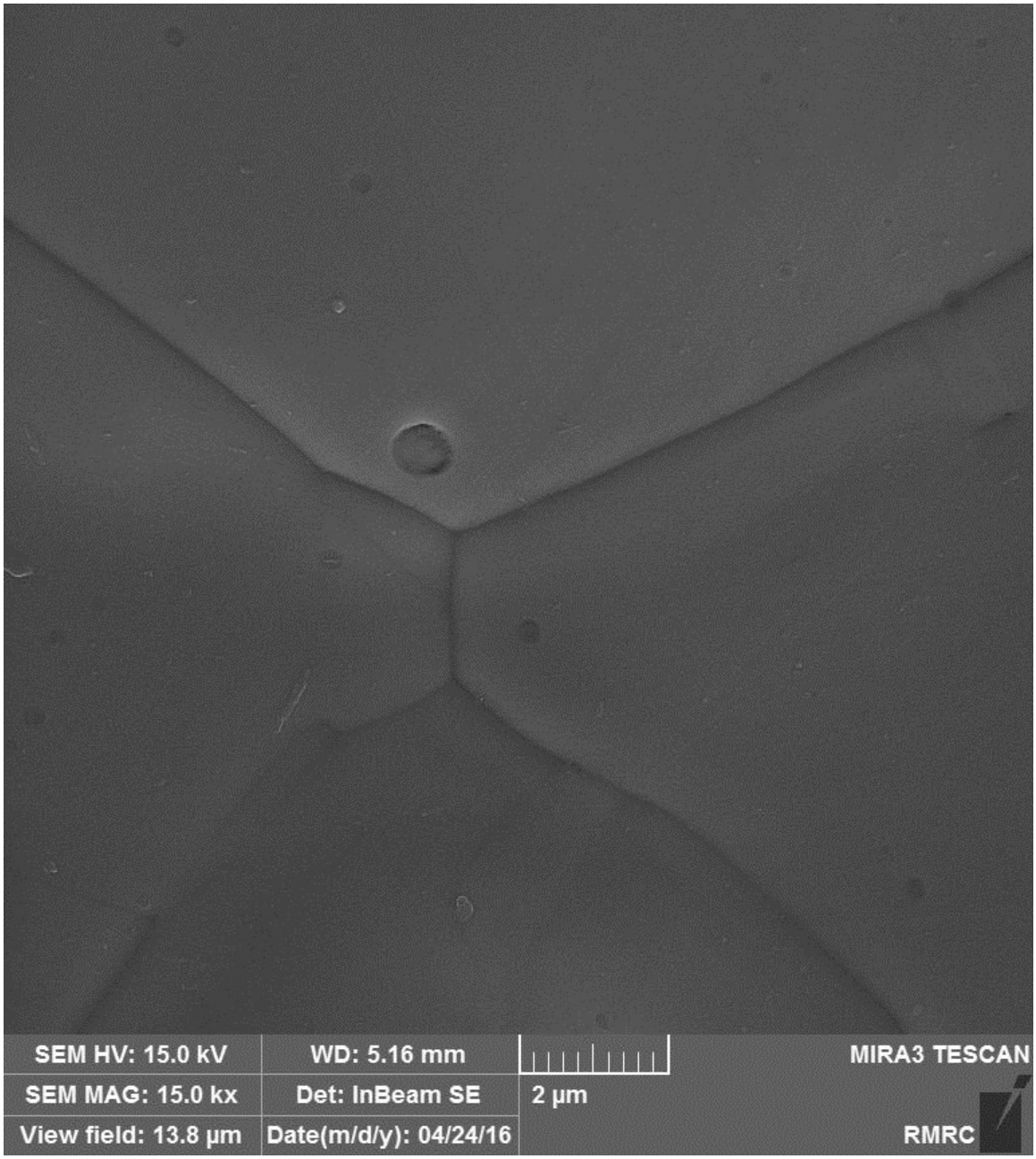

Fig. S4 SEM image from pure Ni foam (Scale bar 2 µm).

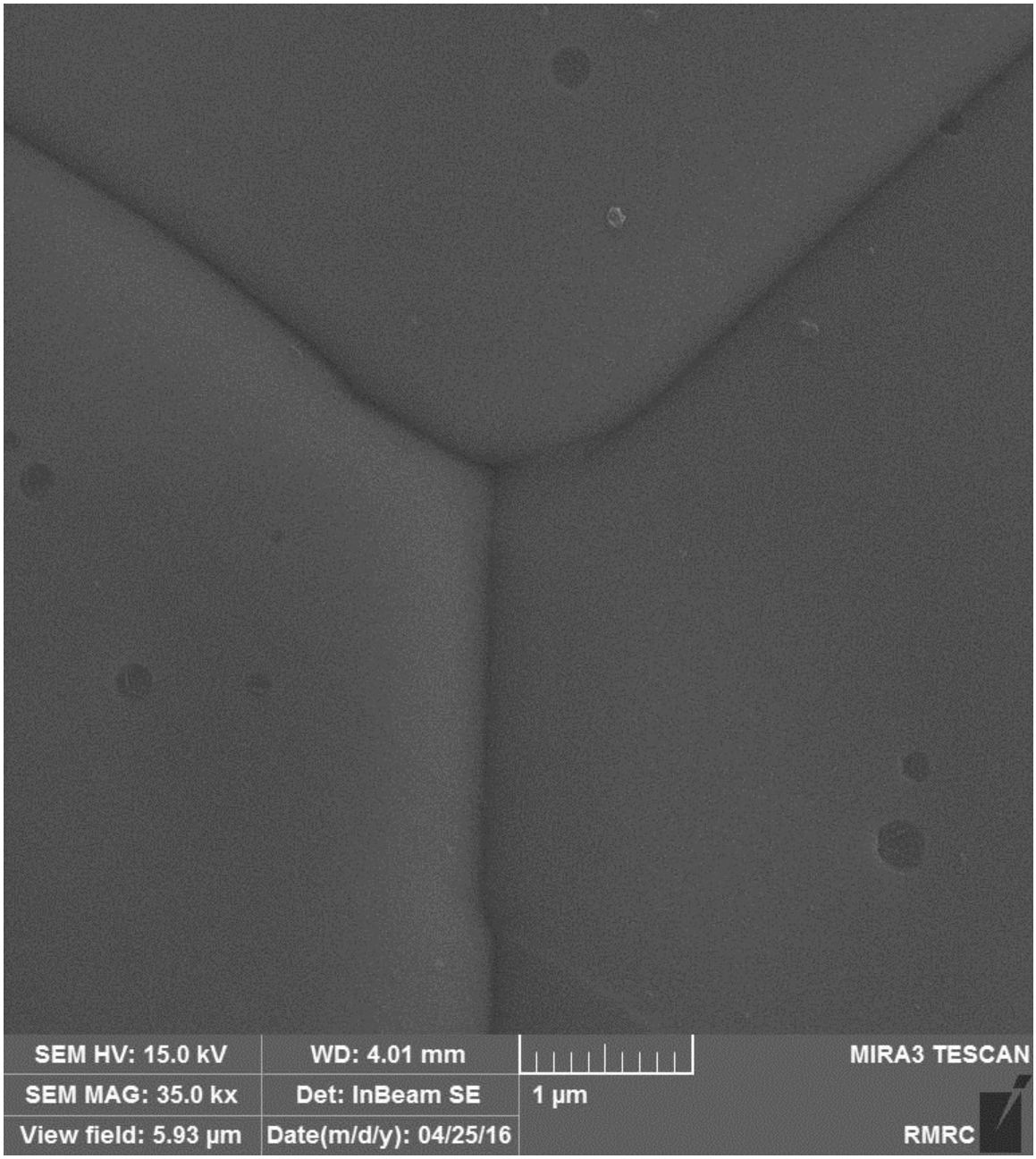

Fig. S5 SEM image from pure Ni foam (Scale bar 1 µm).

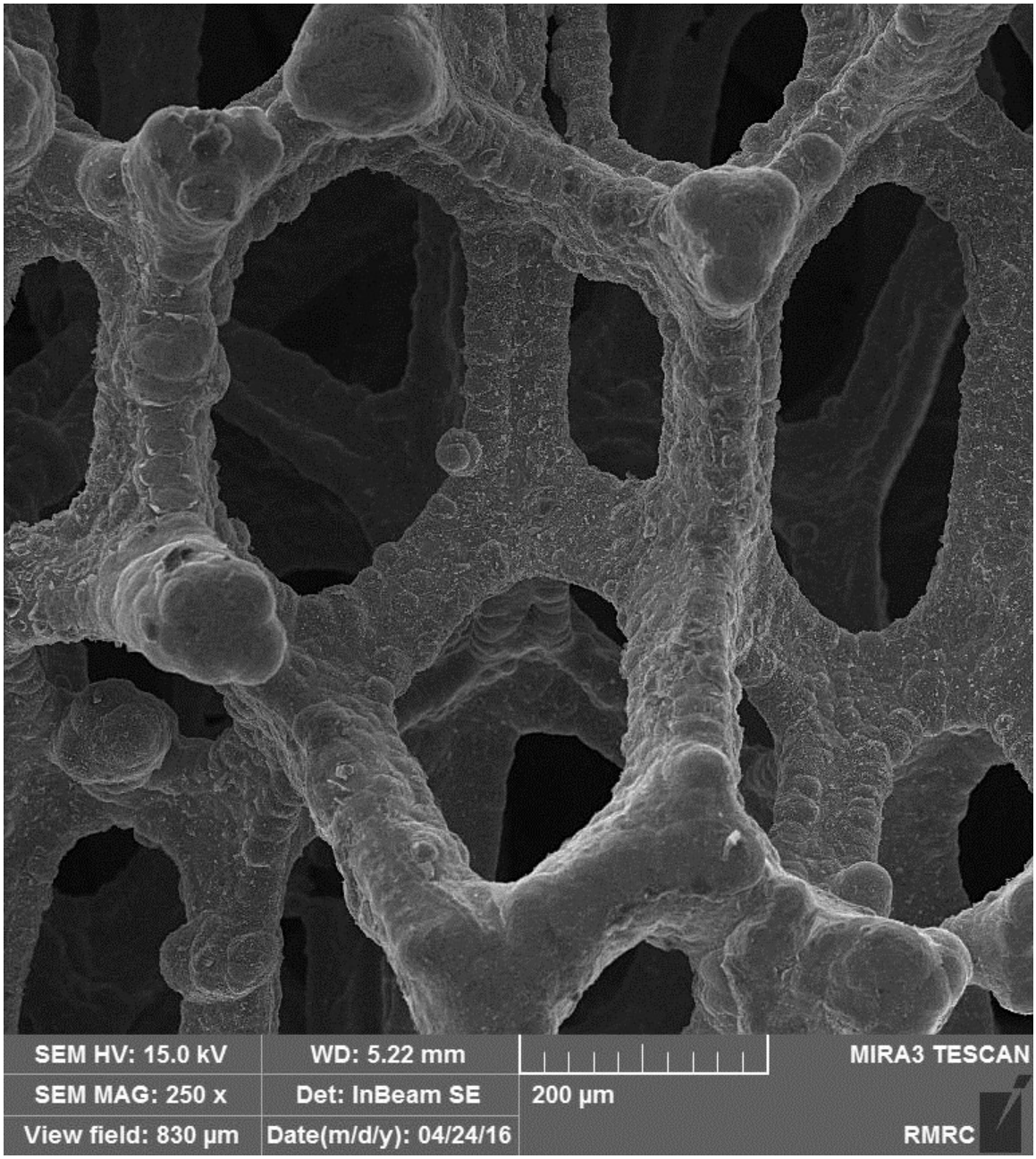

Fig. S6 SEM image from Oxone treated Ni foam (Ni5) (Scale bar 200 µm).

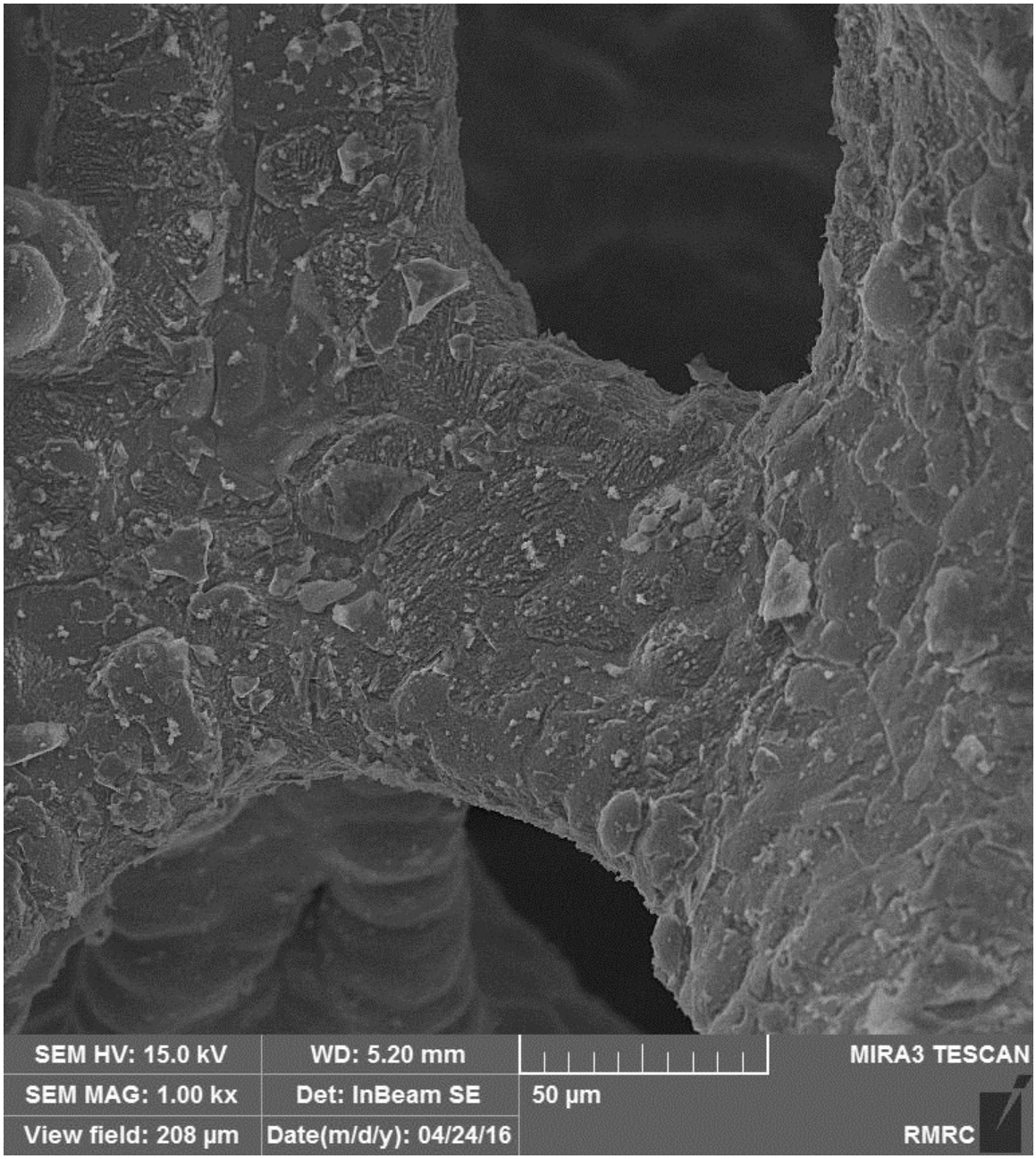

Fig. S7 SEM image from Oxone treated Ni foam (Ni5) (Scale bar 50 µm).

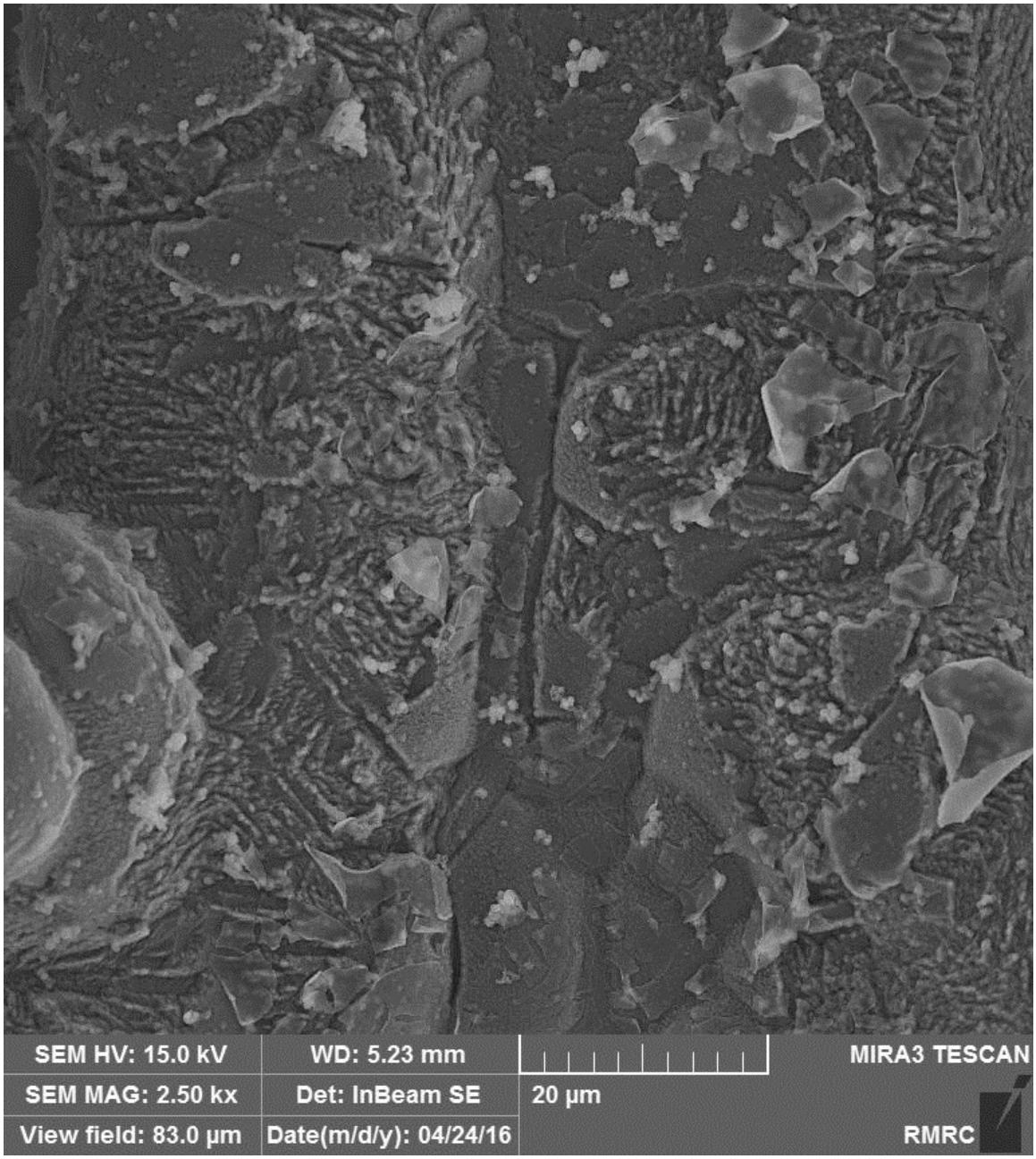

Fig. S8 SEM image from Oxone treated Ni foam (Ni5) (Scale bar 20 µm).

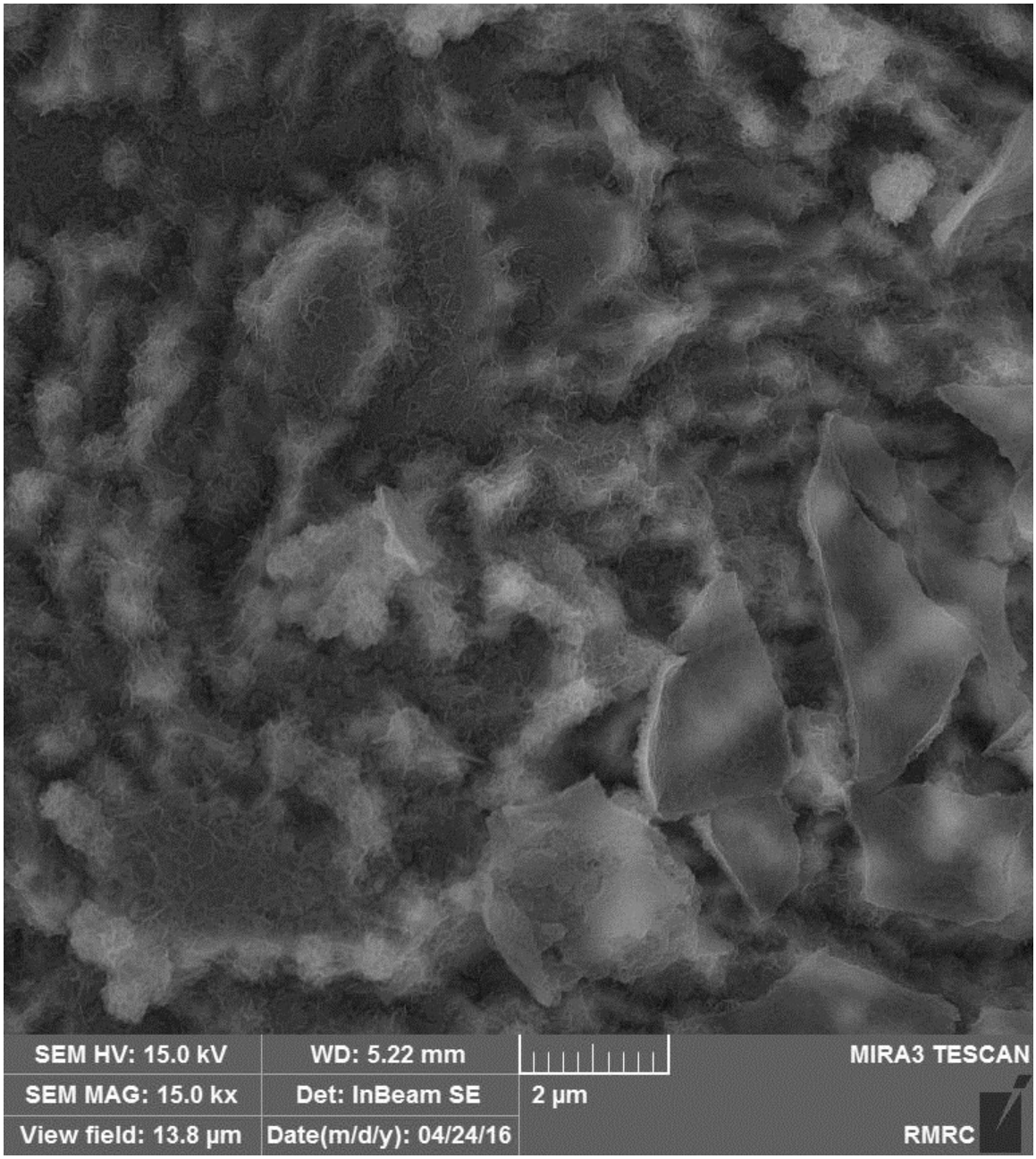

Fig. S9 SEM image from Oxone treated Ni foam (Ni5) (Scale bar 2 µm).

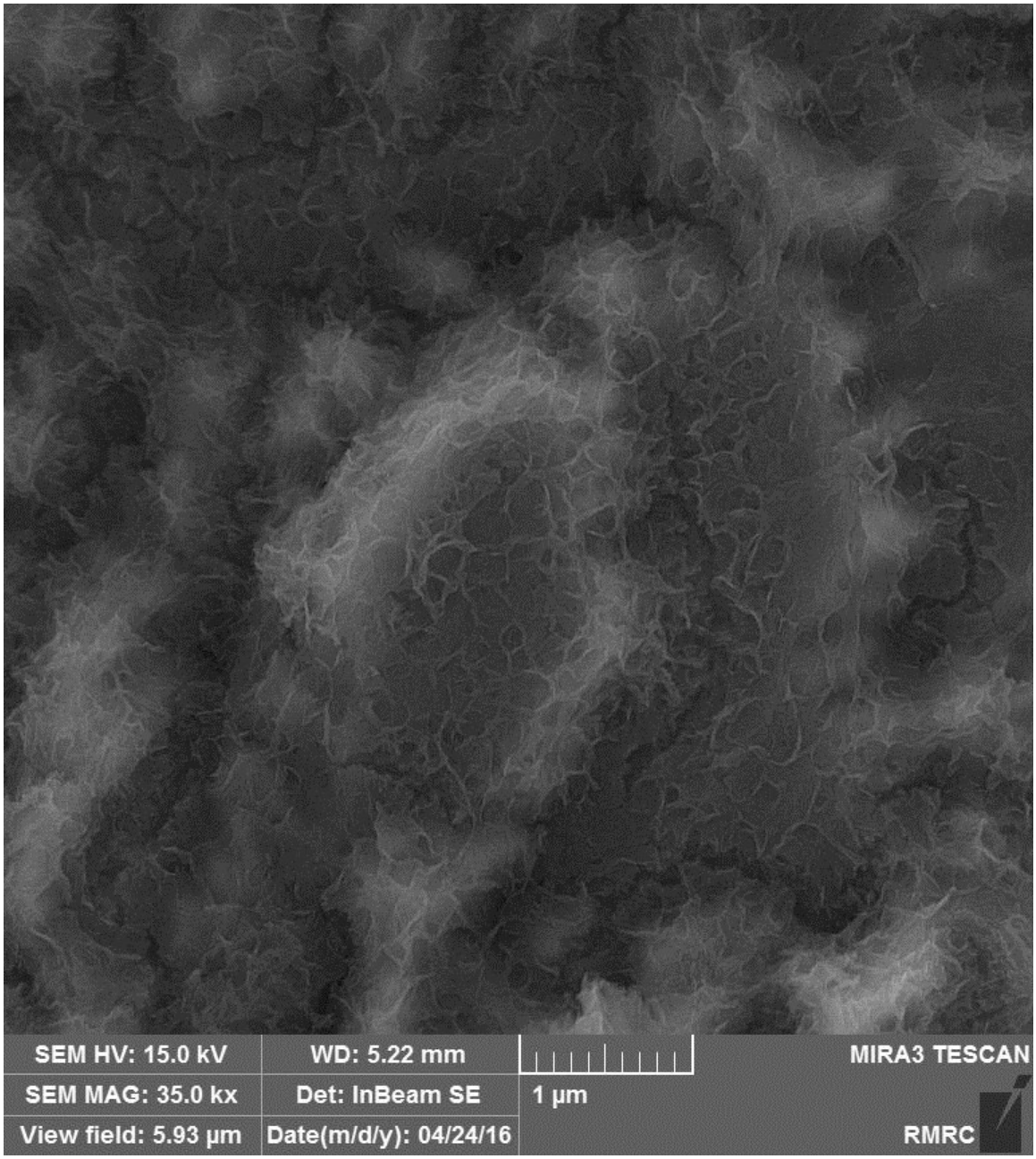

Fig. S10 SEM image from Oxone treated Ni foam (Ni5) (Scale bar 1 µm).

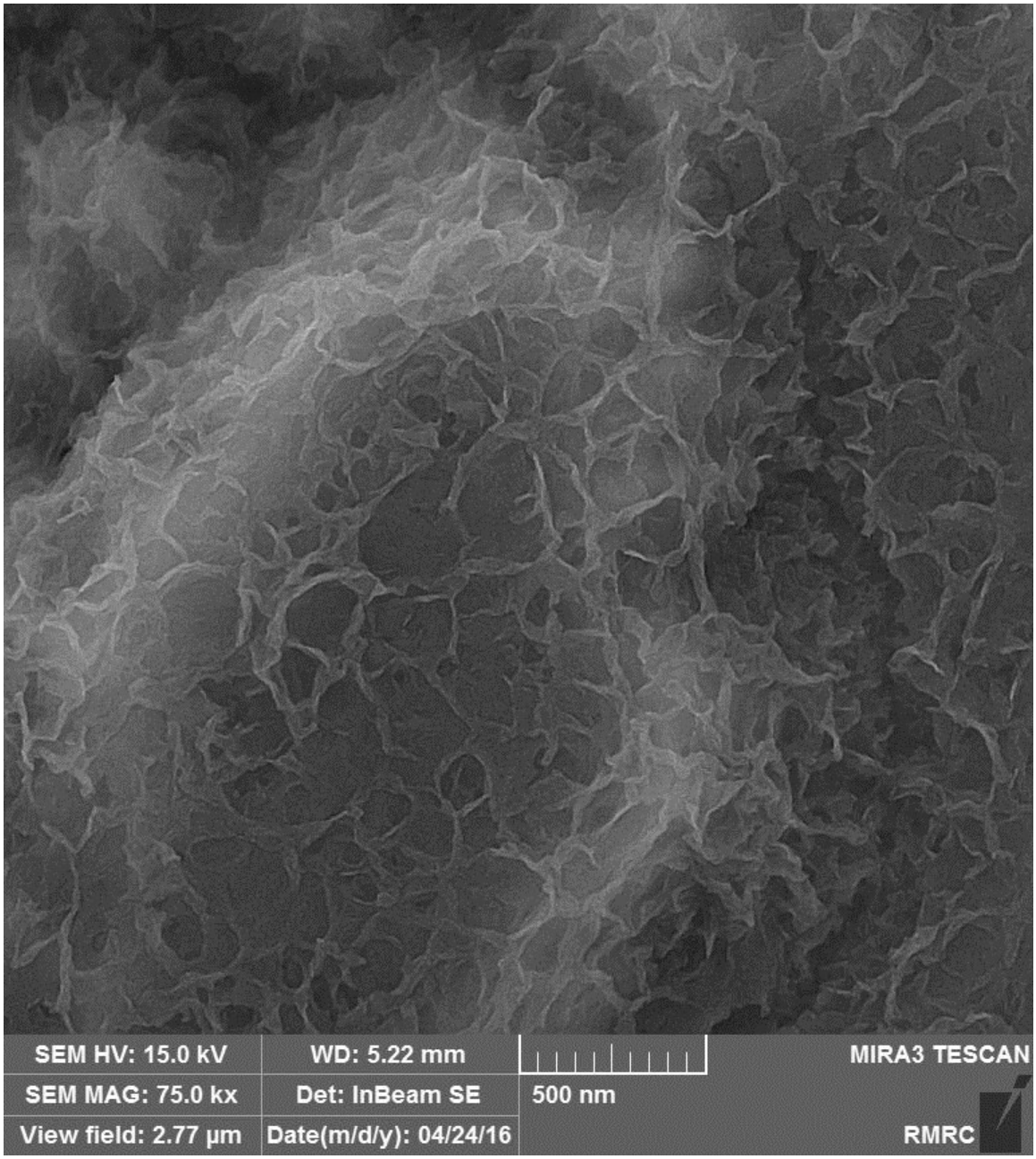

Fig. S11 SEM image from Oxone treated Ni foam (Ni5) (Scale bar 500 nm).

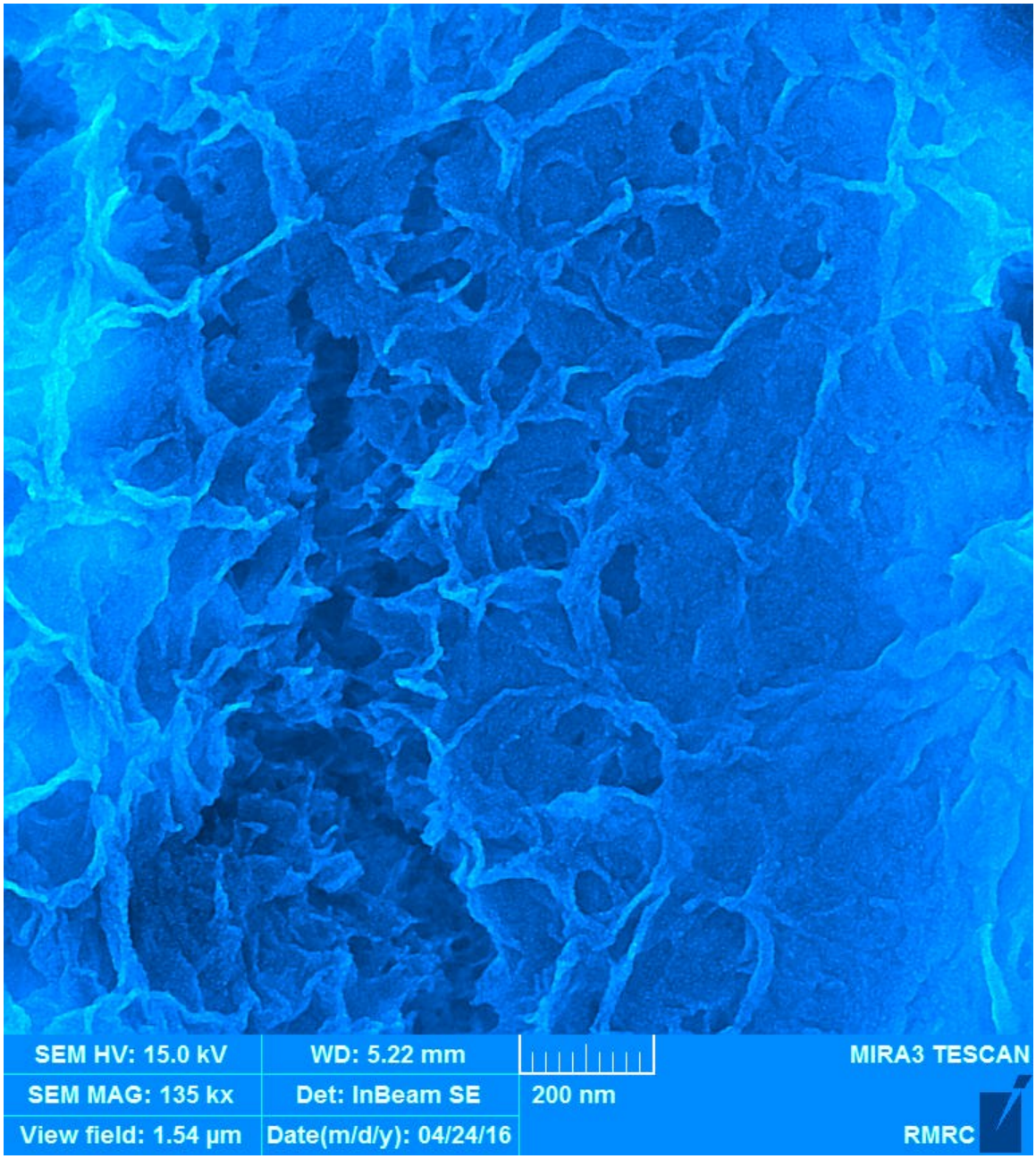

Fig. S12 SEM image from Oxone treated Ni foam (Ni5) (Scale bar 200 nm).

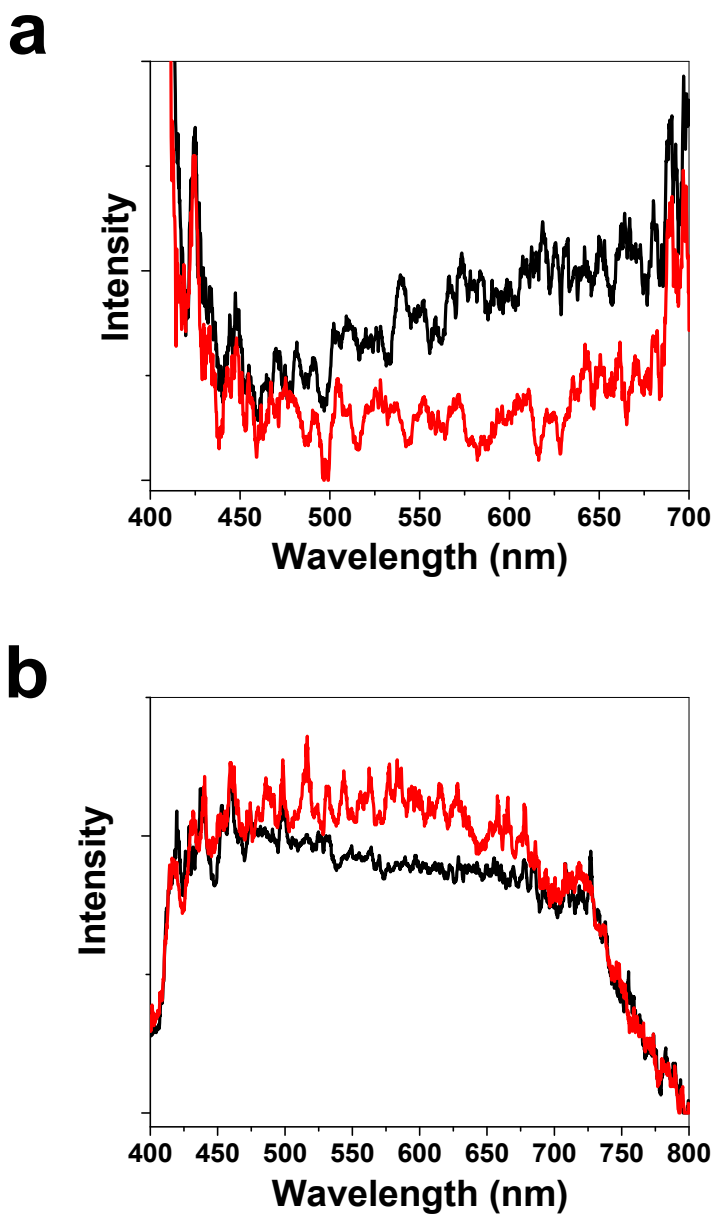

Fig. S13 Visible spectra from Ni foam (black) and Oxone treated Ni foam (Ni300) (red) (a: reflection; b: absorption).

Table S1. Comparison of some catalytic parameters for heterogeneous WOCs.
Data from ref. [S1-S22] and Table was modified from ref. S23.

Compound	η[a] [mV]	η[b] [mV]	pH	Ref.
Treated Ni foam by Oxone	-	>400[c]	13	This work
$NiFeO_x$	-	297	14	[S1]
NiO_x	> 400	> 1000	14	[S2]
NiO_x	-	300	14	[S1]
CoO_x	-	381	14	[S1]
$NiCoO_x$	-	312	14	[S1]
FeO_x	345	445	14	[S3]
FeO_x	-	405	14	[S1]
Fe_2O_3	< 350	430	14	[S4]
MnO_x	320	514	14	[S1]
$Fe_3Ni_2O_x$	270	-	13	[S5]
$FeNiO_x$	211	-	13	[S6]
$Fe_2Ni_3O_x$	190	250	13	[S7]
NiO_x	191	280	13	[S6]
NiO_x	295	-	13	[S8]
$CoFeO_x$[d]	397	-	13	[S9]
CoO_x	< 200	< 250	13	[S10]
FeO_x	320	410	13	[S6]
CoO_x	210	270	13	[S6]
CoO_x	295	-	13	[S5]
$FeCoO_x$	181	-	13	[S6]
$FeCoNiO_x$	191	-	13	[S6]
Ni_2FeAlO_x	270	-	13	[S5]
$NiFeMo_3O_x$	250	-	13	[S5]
$Ni_2FeCr_2O_x$	240	-	13	[S5]
$NiFeGa_3O_x$	240	-	13	[S5]
$CoSe_2$	373	380	13	[S11]
NG-$CoSe_2$	294	320	13	[S11]
MnO_x	< 300	> 1000	>11.5	[S12]
FeOOH	300	420	11	[S13]
NiB_i	300	425	9.2	[S14]
MnO_x	< 300	> 1000	8.5-5.5	[S12]
CoO_x	< 200	< 300	7	[S10]
MnO_x	390	590	7	[S15]
MnO_x	441	600	7	[S16]
CoFePBA	291	> 600	7	[S17]
MnO_x	150	> 1000	7	[S18]
CoP_i	281	410	7	[S19]
MnO_x	> 700	> 1000	7	[S20]
$Li_xMnP_2O_7$	500	-	7	[S21]
$Co(PO_3)_2$	313	320	6.4	[S22]
MnO_x	< 300	> 1000	3.5	[S12]
Co^{2+} (1 M)	< 580	600	1	[S10]

[a] Onset overpotentiol. [b] for 1 mA/cm^2. [c] for 10.0 mA/cm^{2}overpotential is 626 mV.[d] Layered double hydroxides (LDH).

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