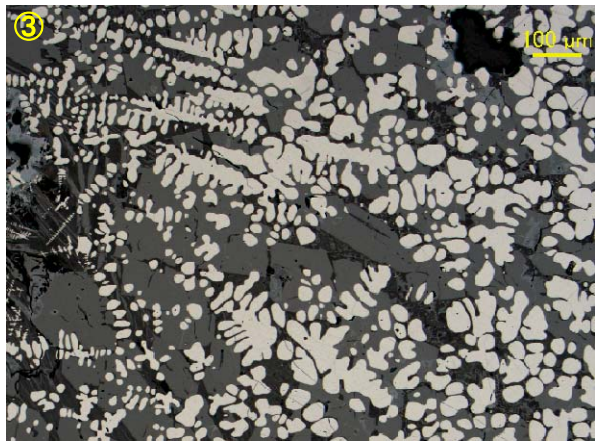
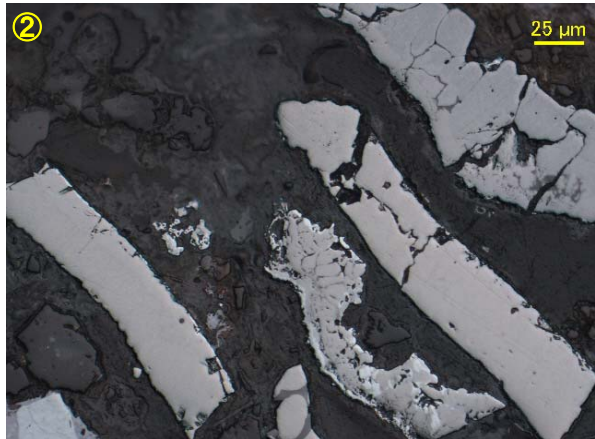
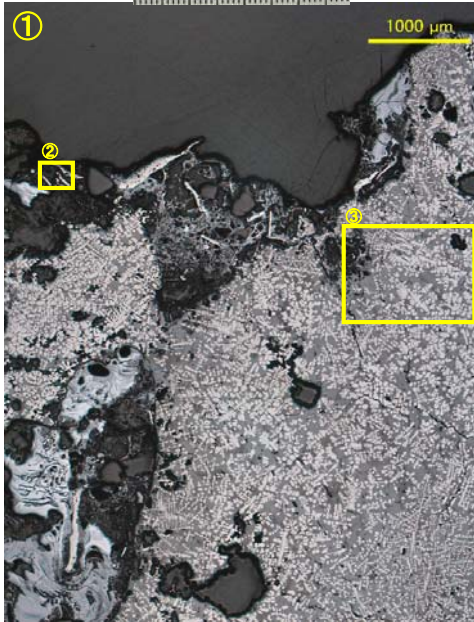


KYS-1
 椀形鍛冶滓
 ①表面鍛造剥片付着、滓部:ウスタイト・ファヤライト
 ②鍛造剥片拡大
 ③滓部拡大



KYS-2
 鍛冶滓(流動状)
 ④～⑥滓部:マグネタイト・ファヤライト

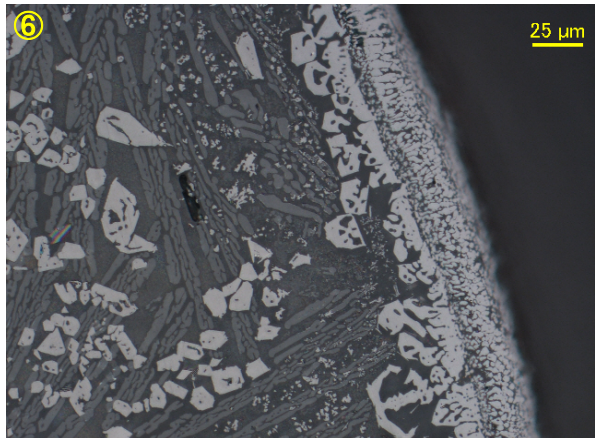
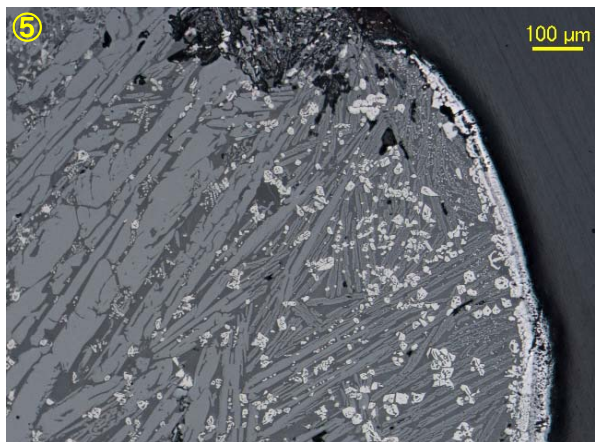
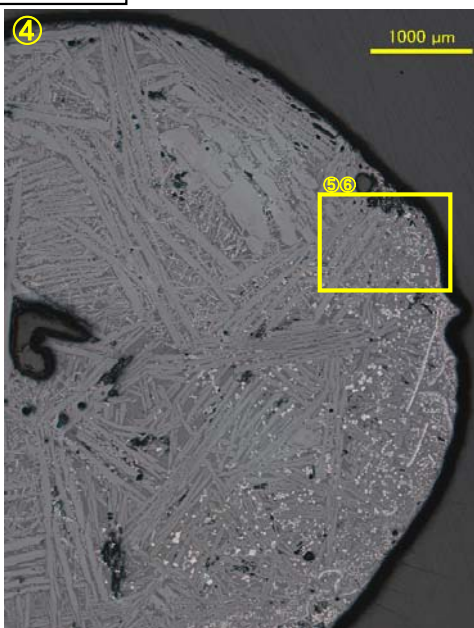
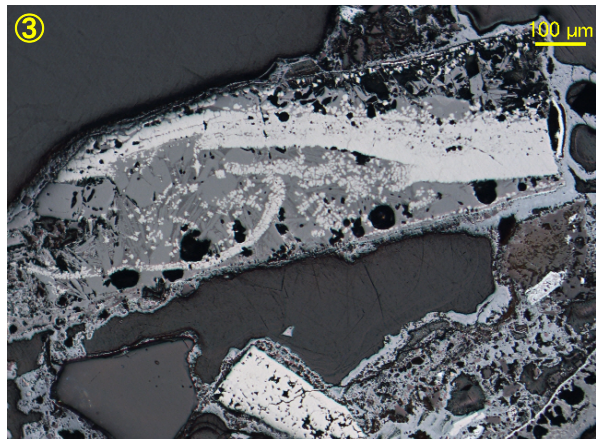
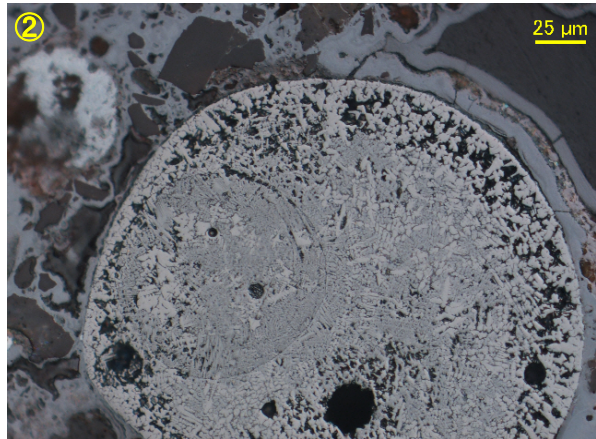
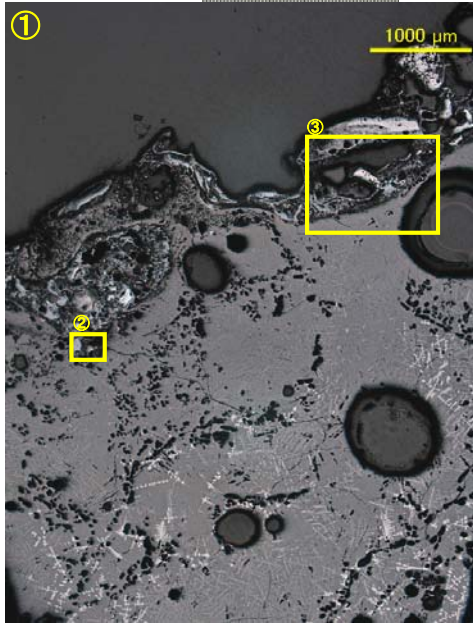


Photo.1 椀形鍛冶滓・鍛冶滓(流動状)の顕微鏡組織

KYS-3

椀形鍛冶滓

- ①滓部:ウスタイト・ファヤライト
- ②表面粒状滓附着、マグネタイト晶出
- ③滓部表層:鍛造剥片分



KYS-4

鍛冶滓(ガラス質滓)

- ④右上:ガラス質滓(炉材粘土溶融物)、微小金属鉄粒点在、左下:鍛冶滓
- ⑤微小金属鉄粒、ナイトルetch ハーライト
- ⑥鍛冶滓拡大、ウスタイト

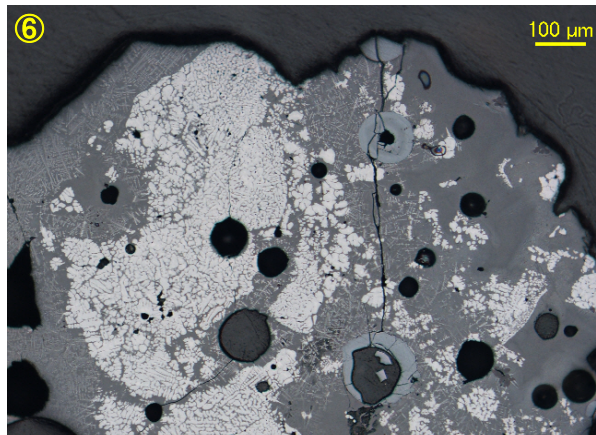
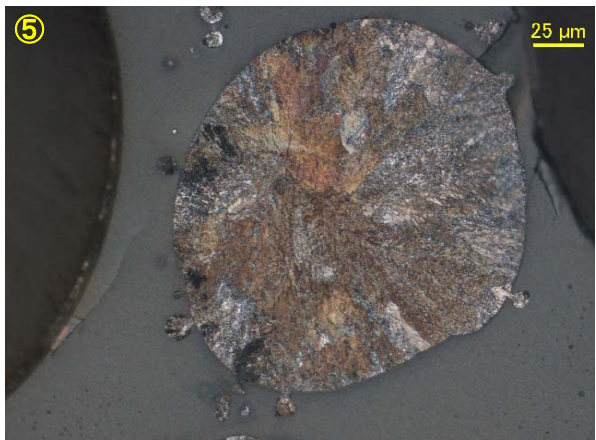
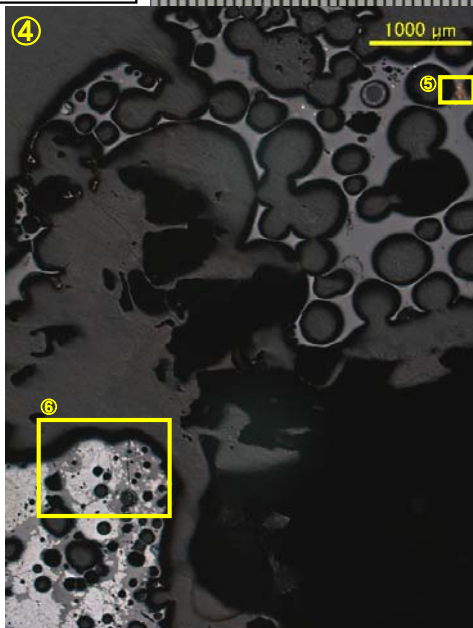
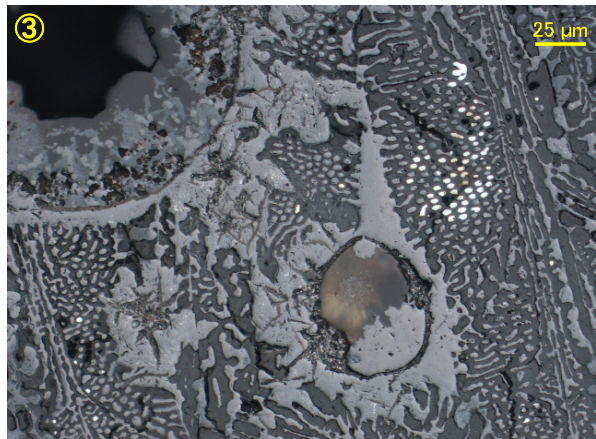
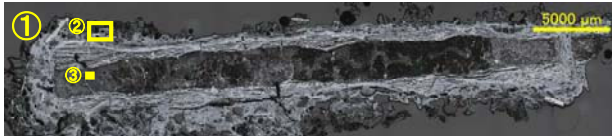
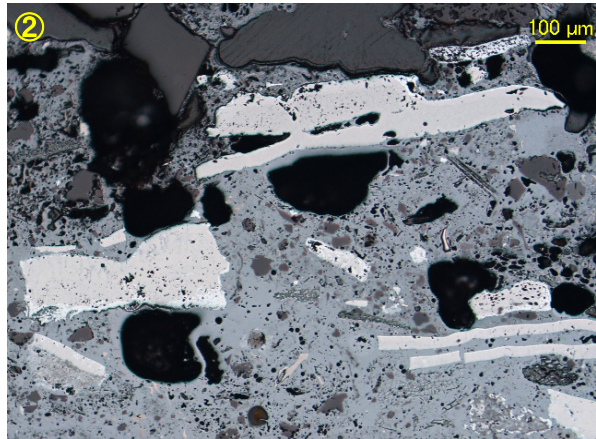


Photo.2 椀形鍛冶滓・鍛冶滓(ガラス質滓)の顕微鏡組織

KYS-5
鉄製品(鑄造鉄器片)
①マクロ組織
②表面付着土砂中の鍛造剥片
③銹化鉄部拡大:斑鑄鉄



KYS-6
ガラス質滓(炉壁溶融物)
④素地:ガラス質滓、被熱砂粒混在、明白色粒:金属鉄
⑤⑥金属鉄粒拡大、ナイトルetch 過共析組織
⑥ガラス質滓、被熱砂粒拡大

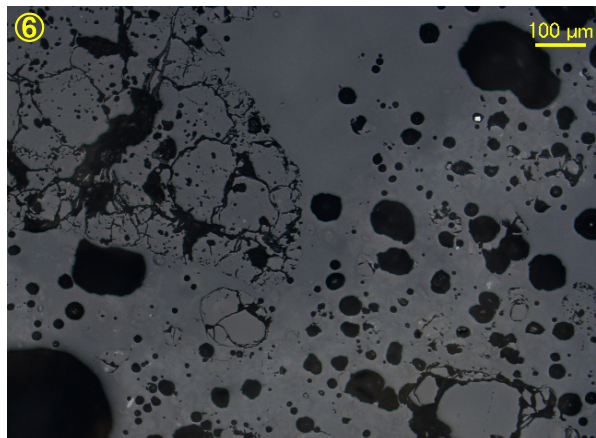
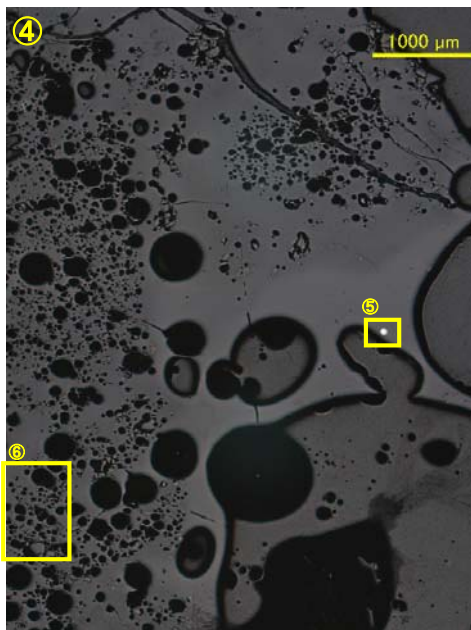
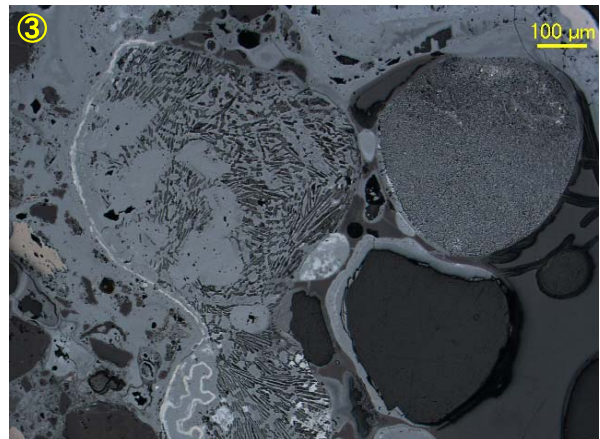
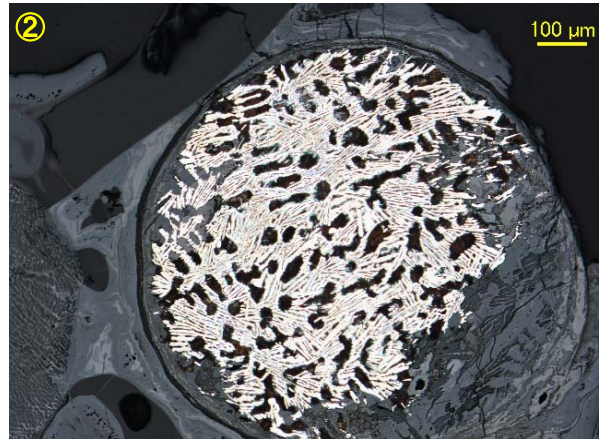
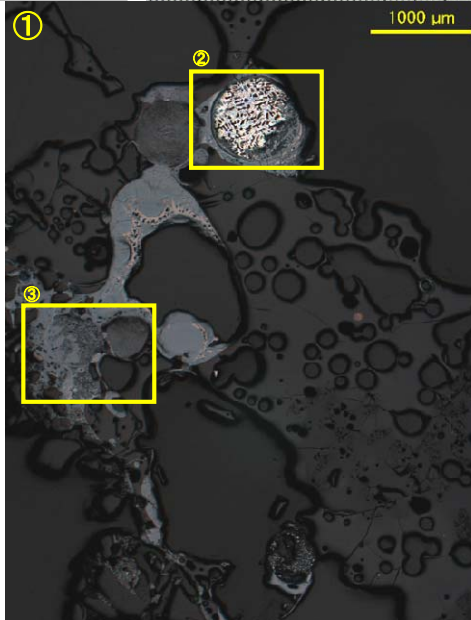


Photo.3 鉄製品(鑄造鉄器片)・ガラス質滓(炉壁溶融物)の顕微鏡組織

KYS-7

ガラス質滓

- ①素地:ガラス質滓、微小金属鉄、銹化鉄粒散在
- ②金属鉄粒、ナイトルetch 亜共晶組成白鑄鉄組織
- ③銹化鉄粒:白鑄鉄組織



KYS-8

ガラス質滓

- ④~⑥素地:ガラス質滓、被熱砂粒混在、明白色粒:金属鉄

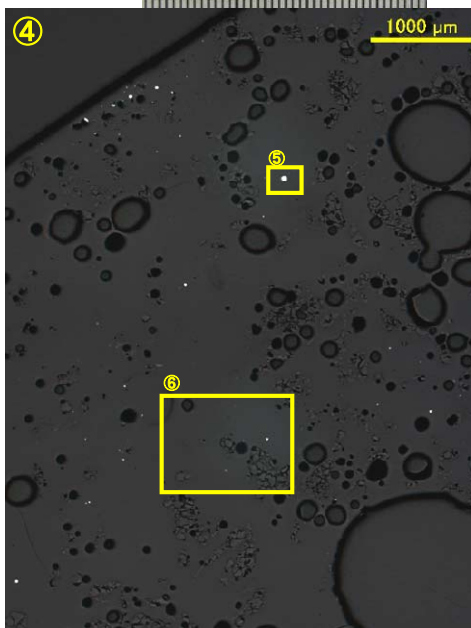
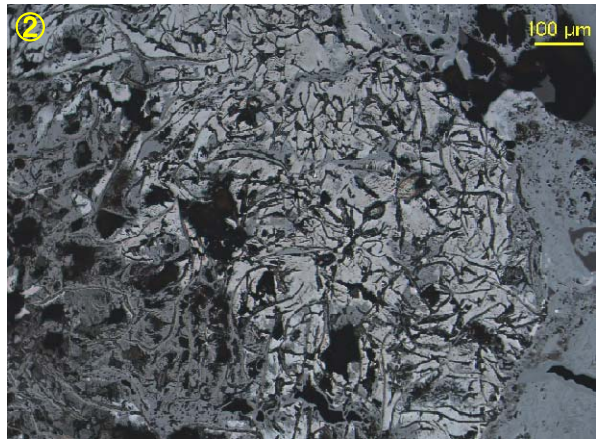
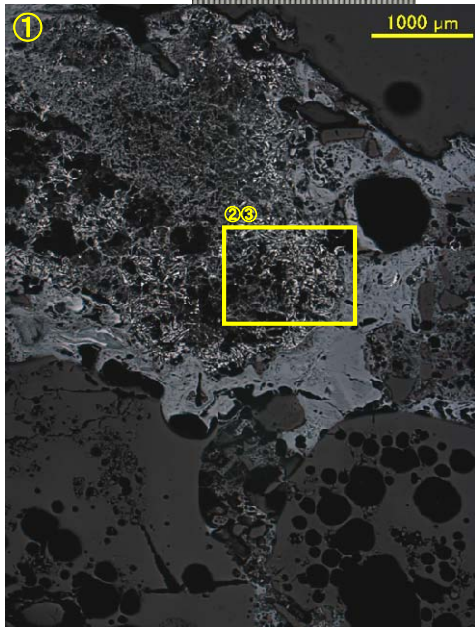


Photo.4 ガラス質滓の顕微鏡組織

KYS-9

炉壁

- ①上側: 錆化鉄付着、下側: 内面表層ガラス質滓
- ②③錆化鉄部拡大: ねずみ鑄鉄組織痕跡



KYS-10

羽口

- ④表層: ガラス質滓、内側: 被熱粘土
- ⑤⑥ガラス質滓拡大、マグネタイト晶出

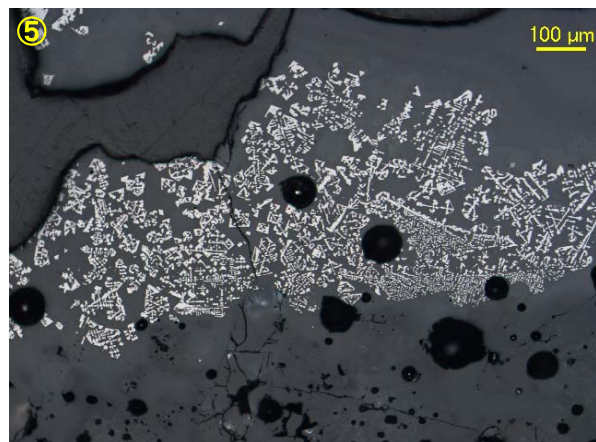
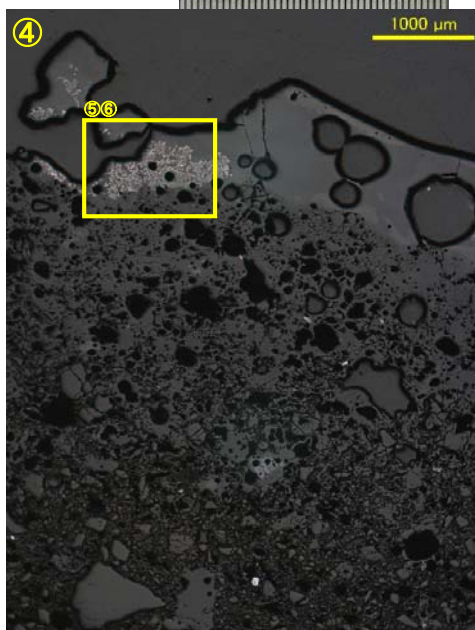
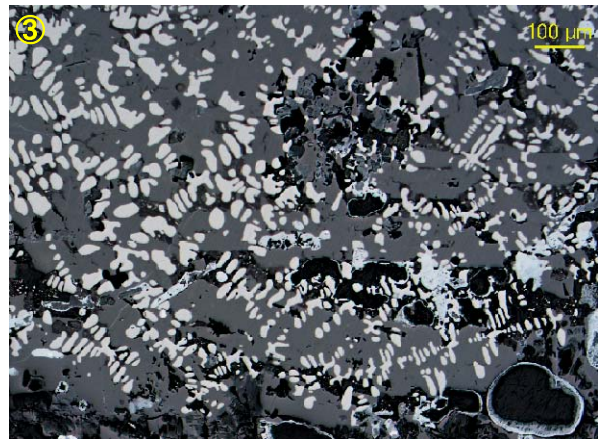
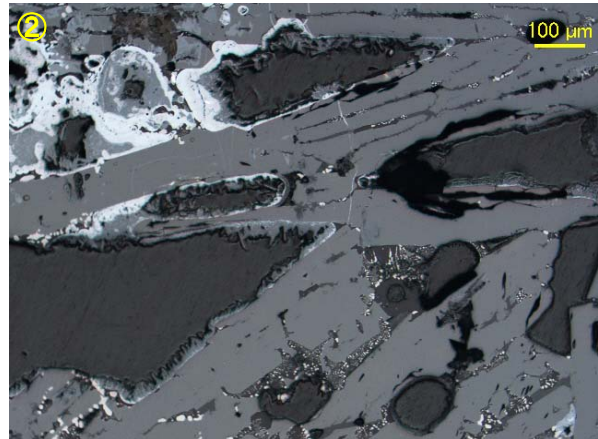
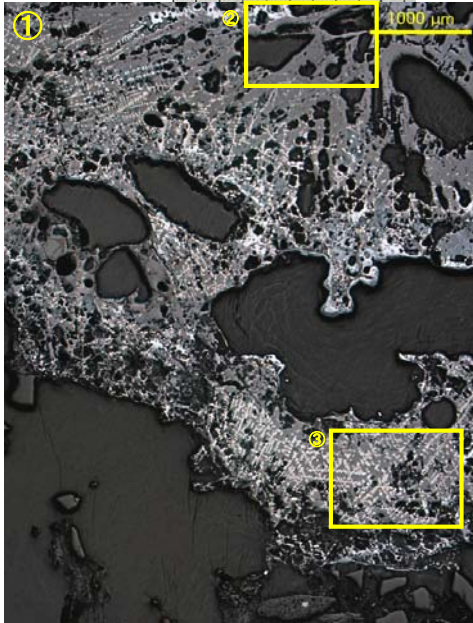


Photo.5 炉壁・羽口の顕微鏡組織

KYS-11

椀形鍛冶滓

①滓部:(上側)ファヤライト主体、(下側)ウスタイト・ファヤライト、不定形青灰色部:錆化鉄



KYS-12

椀形鍛冶滓

④黒色部:木炭破片、広葉樹材
⑤木炭破片、⑥滓部拡大

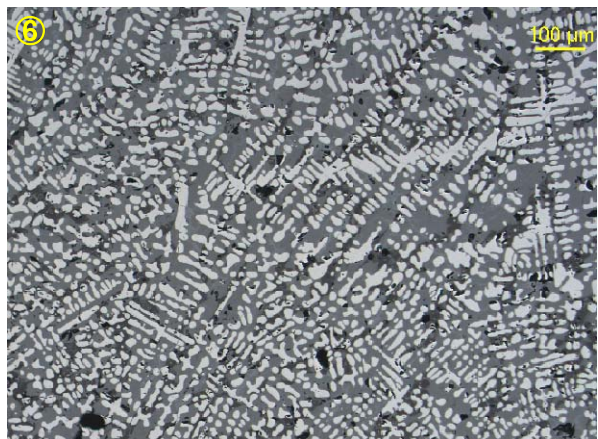
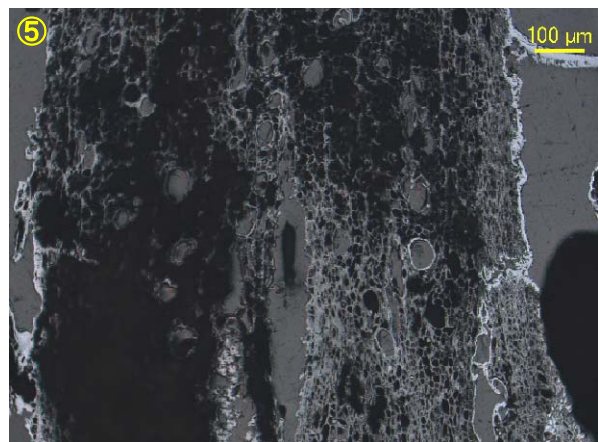
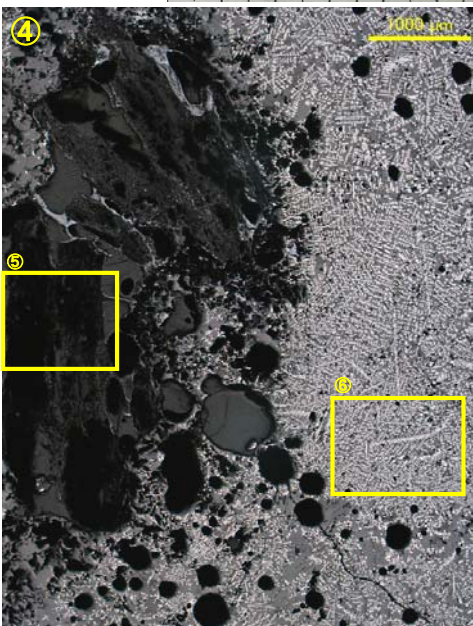
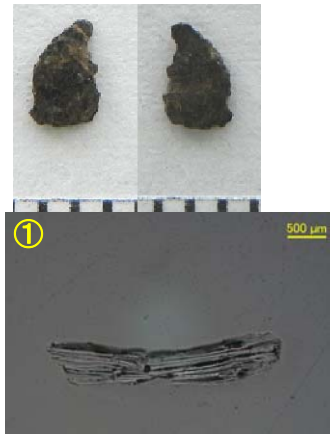
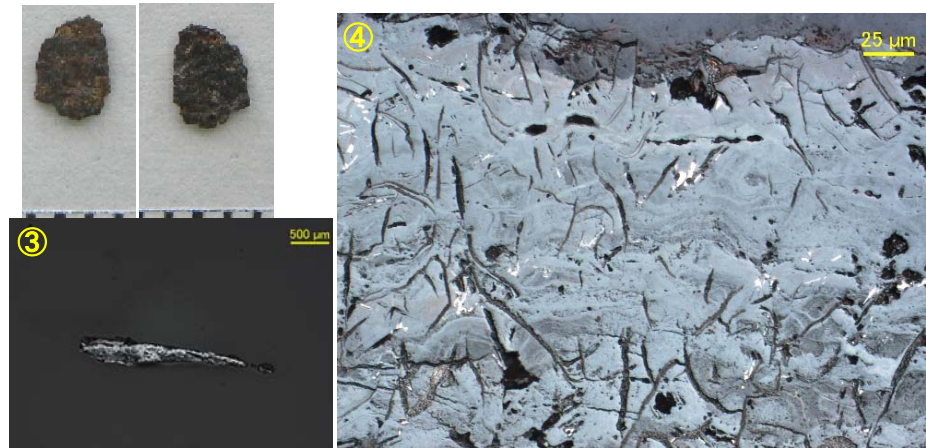


Photo.6 椀形鍛冶滓の顕微鏡組織

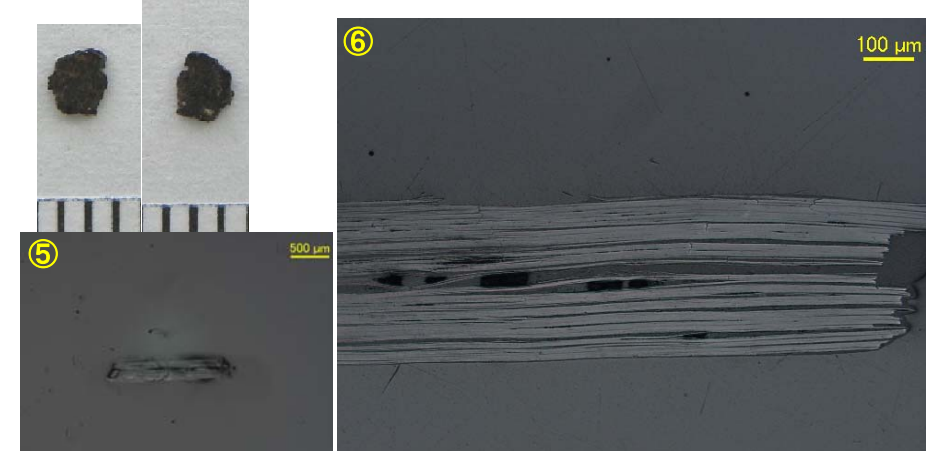
KYS-13-1
 鍛造剥片様遺物
 ①マクロ組織
 ②木材組織



KYS-13-2
 鍛造剥片様遺物
 ③マクロ組織
 ④錆化鉄:ねずみ鑄鉄組織痕跡



KYS-13-3
 鍛造剥片様遺物
 ⑤マクロ組織
 ⑥木材組織



KYS-13-4
 鍛造剥片
 ⑦マクロ組織
 ⑧明白色層:ヘマタイト
 灰褐色層:マグネタイト
 灰色層:ウスタイト

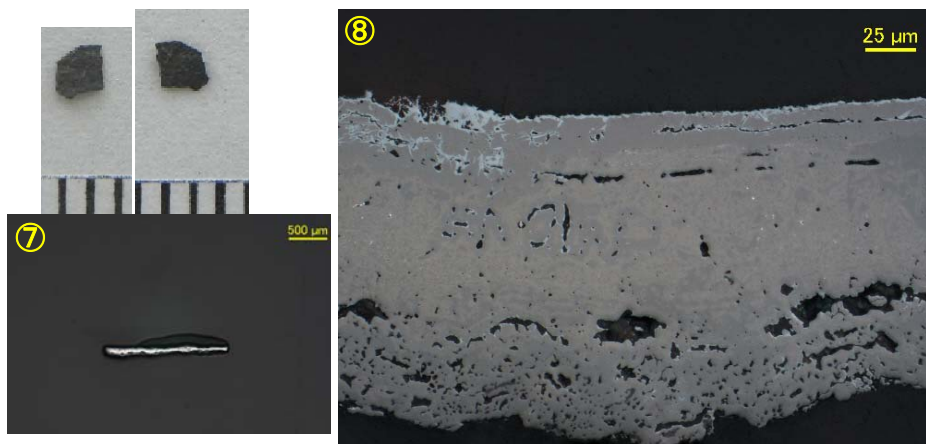
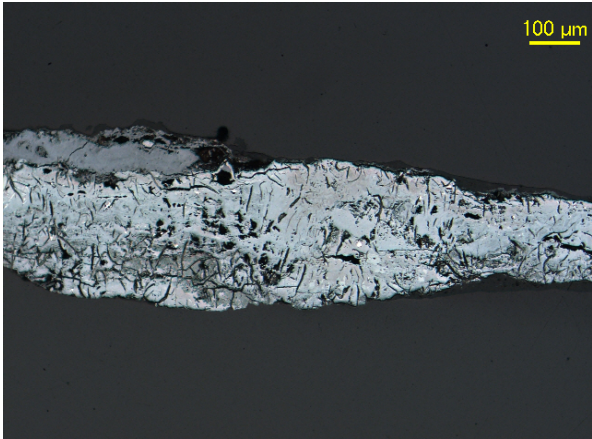
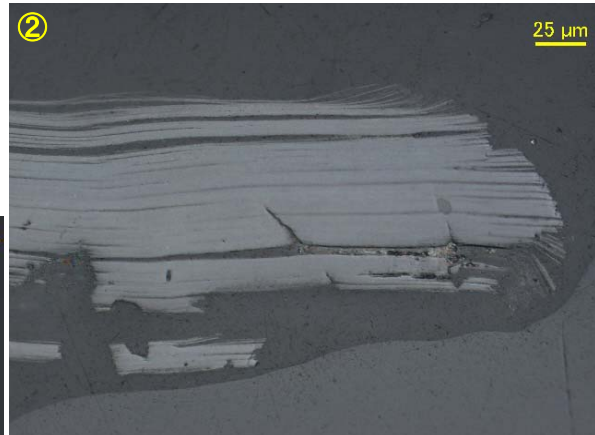


Photo.7 鍛造剥片の顕微鏡組織



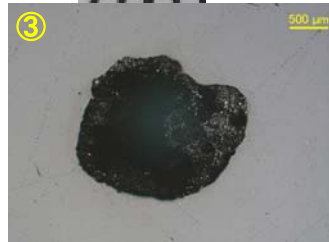
KYS-13-5
鍛造剥片様遺物

- ①マクロ組織
- ②木材組織



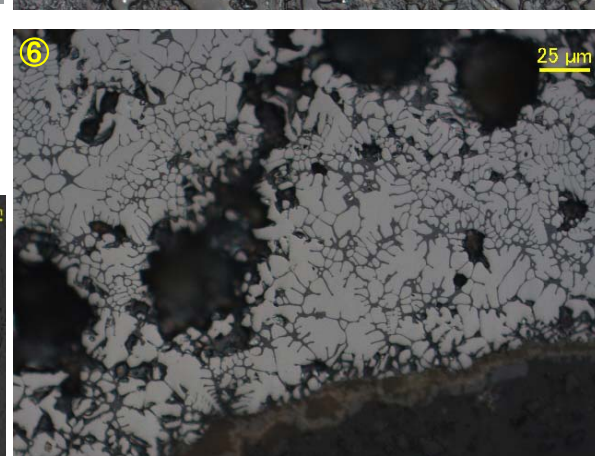
KYS-14-1
粒状滓様遺物

- ③マクロ組織
- ④粘土鉱物



KYS-14-2
粒状滓

- ⑤マクロ組織
- ⑥滓部:ウスタイト



KYS-15

羽口?

- ⑦ガラス質滓部分、明白色粒:金属鉄、ナイトルetch 過共析組織、青白色粒:酸化鉄

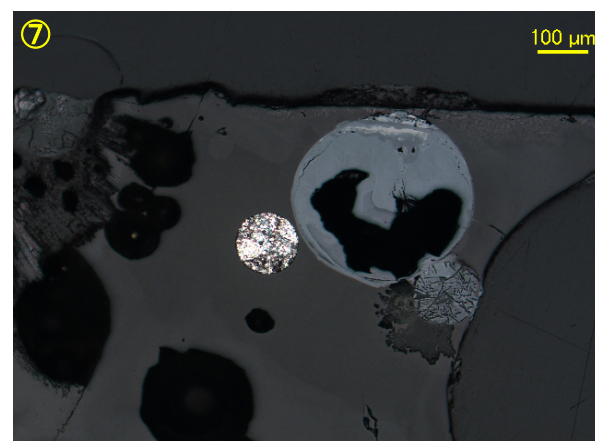


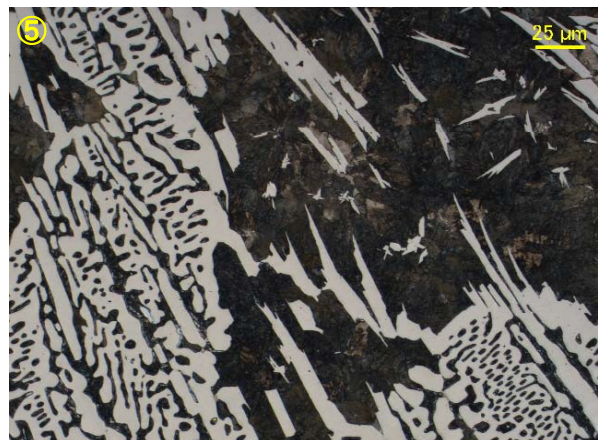
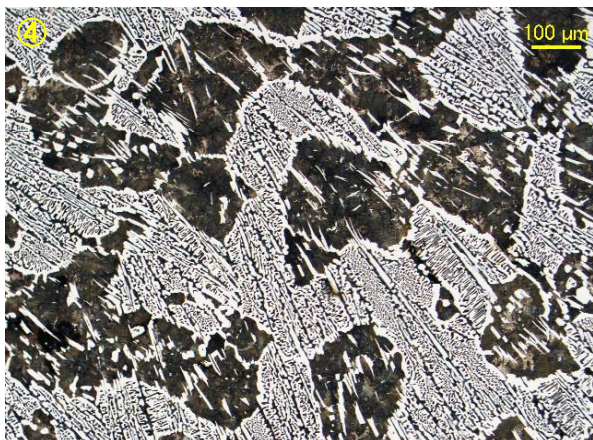
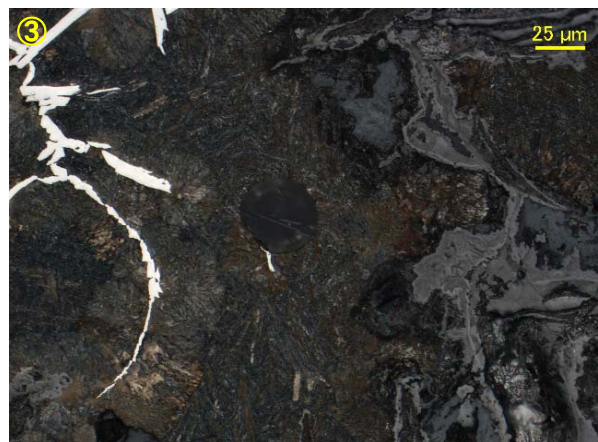
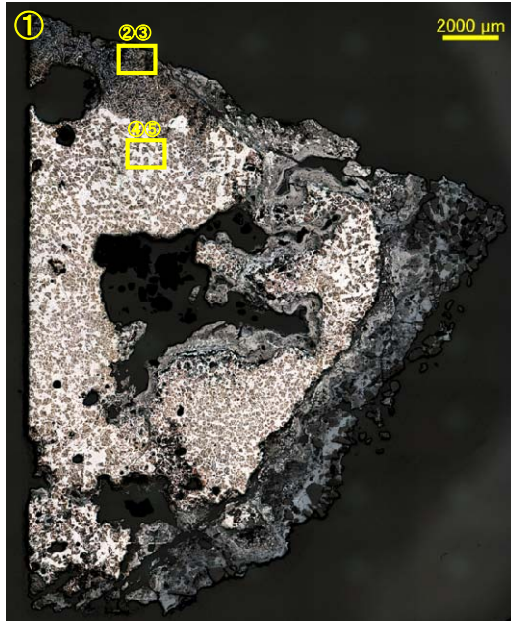
Photo.8 鍛造剥片・粒状滓・羽口の顕微鏡組織



KYS-16

鉄塊系遺物

- ①マクロ組織、ナイタルetch
- 斑鑄鉄組織
- ②③ねずみ鑄鉄組織
- ④⑤亜共晶組成白鑄鉄



鉄中非金属介在物の反射電子像 (COMP) および特性X線像

定量分析値		
Element	1	2
Cu	0.102	0.076
Pb	0.065	0.002
Sn	0.007	0.011
Zn	-	0.012
Fe	60.420	63.726
Ag	-	0.008
O	0.014	-
S	34.954	33.640
Ti	-	-
Mn	-	-
V	-	-
Total	95.566	97.475

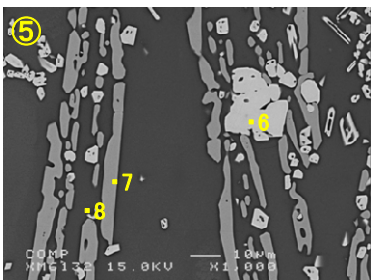
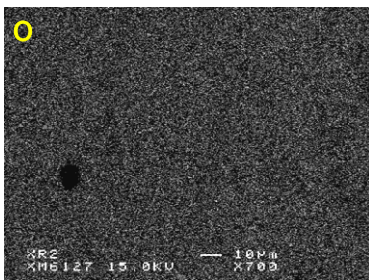
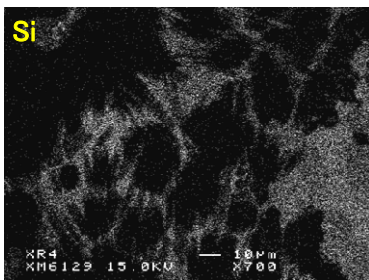
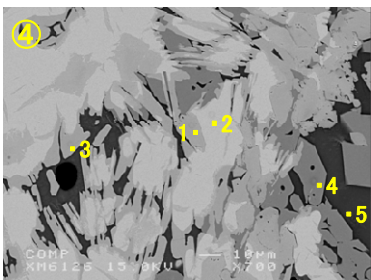
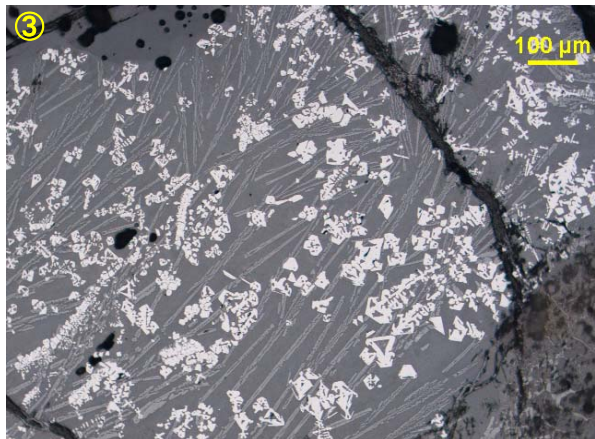
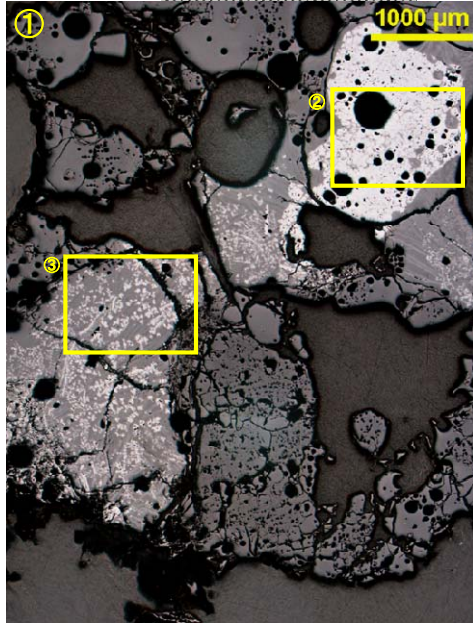
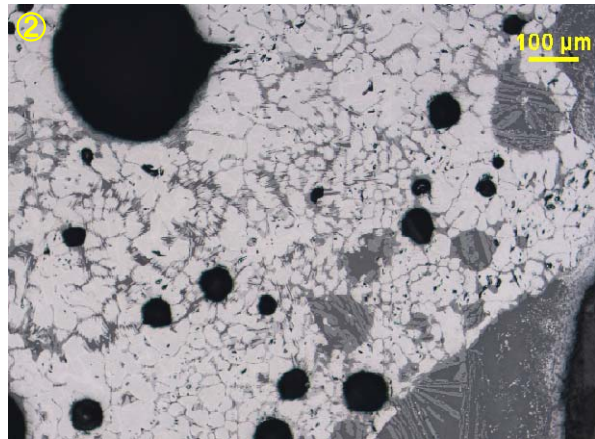
Photo.9 鉄塊系遺物の顕微鏡組織・EPMA調査結果

KYS-17

椀形鍛冶滓(ガラス質滓)

①明色部:鍛冶滓、暗色部:粘土溶融物(ガラス質滓)

②ウスタイト・イスコライト・ファヤラ



定量分析値

Element	1	2	3	4	5	6	7	8
F	-	-	-	-	-	-	0.125	0.404
Na ₂ O	-	0.237	-	0.188	1.545	-	-	2.746
MgO	0.250	0.078	0.583	1.750	0.129	0.212	3.438	0.447
Al ₂ O ₃	0.340	4.233	2.060	0.136	13.874	3.896	0.015	10.154
SiO ₂	0.469	0.734	9.476	31.039	43.958	3.336	31.360	54.986
P ₂ O ₅	-	-	-	0.110	0.930	0.064	0.052	0.597
S	-	0.003	0.004	0.007	0.104	0.007	0.005	0.048
K ₂ O	-	-	0.001	0.070	4.096	0.482	0.078	4.398
CaO	-	-	0.010	1.681	9.946	0.259	1.148	5.946
TiO ₂	0.103	0.542	0.147	0.048	0.085	1.271	0.038	0.093
Cr ₂ O ₃	-	0.031	0.009	-	-	0.055	-	0.018
MnO	0.051	0.029	0.099	0.278	0.084	0.061	0.409	0.116
FeO	101.339	91.616	88.342	65.722	25.511	84.211	64.181	20.518
SrO	-	0.018	0.145	0.167	0.283	-	0.144	0.338
ZrO ₂	-	-	0.057	0.009	-	0.018	-	0.046
Element	102.552	97.521	100.933	101.205	100.545	93.872	100.940	100.685

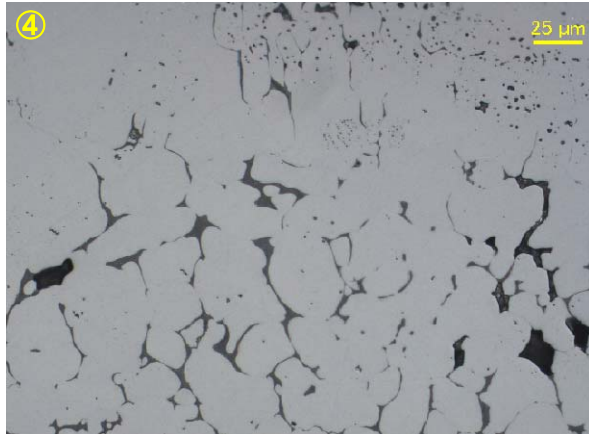
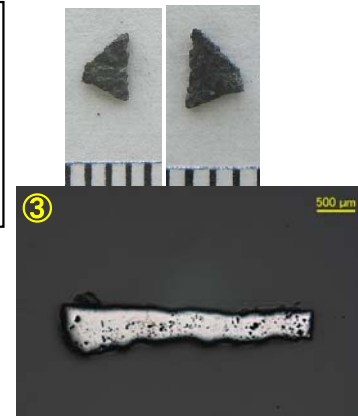
滓部の反射電子像 (COMP) および特性X線像

Photo.10 椀形鍛冶滓(ガラス質滓)の顕微鏡組織・EPMA調査結果

KYS-18-1
 鍛造剥片様遺物
 ①マクロ組織
 ②錆化鉄:亜共晶組成白
 鑄鉄組織痕跡



KYS-18-2
 鍛造剥片様遺物
 ③マクロ組織
 ④鍛冶滓片:ウスタイト



KYS-18-3
 鍛造剥片様遺物
 ⑤マクロ組織
 ⑥錆化鉄:金属組織痕跡
 不明瞭



KYS-18-4
 鍛造剥片様遺物
 ⑦マクロ組織
 ⑧錆化鉄:ねずみ鑄鉄組
 織痕跡か

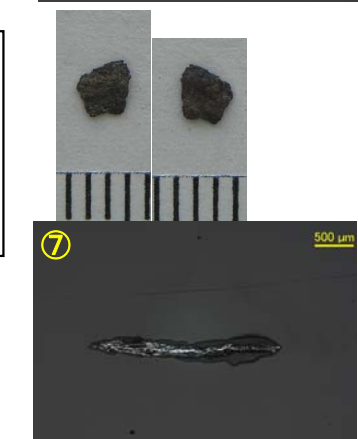
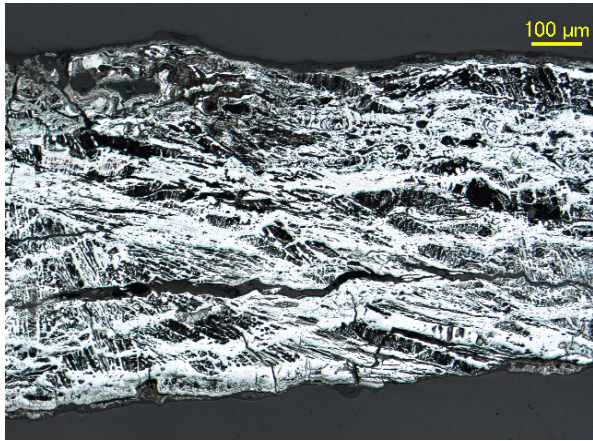
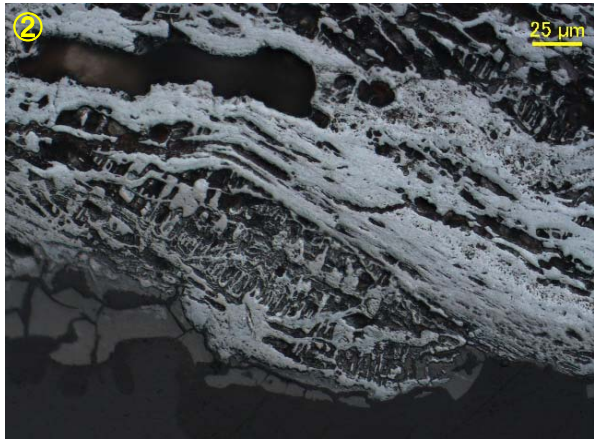
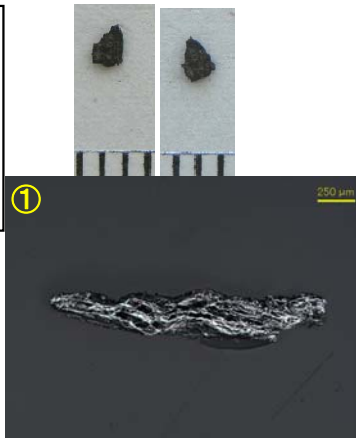


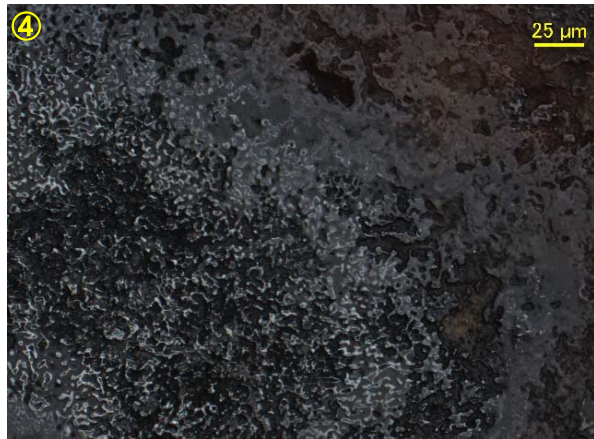
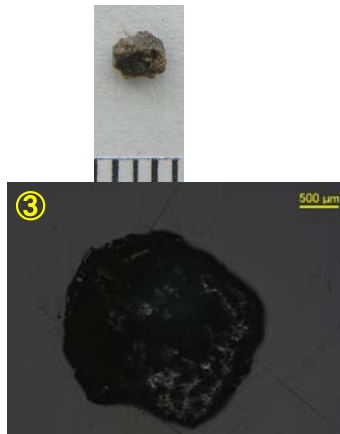
Photo.11 鍛造剥片の顕微鏡組織



KYS-18-5
 鍛造剥片様遺物
 ①マクロ組織
 ②錆化鉄:亜共晶組成白
 鑄鉄組織痕跡



KYS-19-1
 粒状滓様遺物
 ③マクロ組織
 ④錆化鉄



KYS-19-2
 粒状滓様遺物
 ⑤マクロ組織
 ⑥⑦微細岩石破片

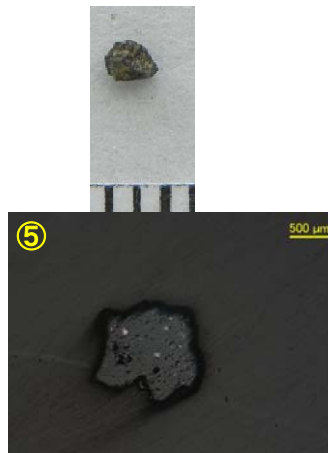
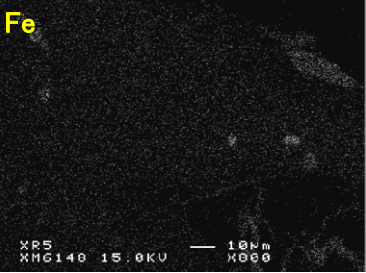
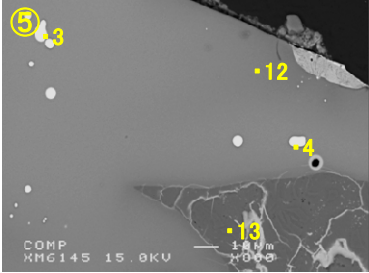
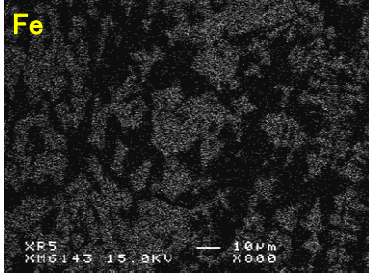
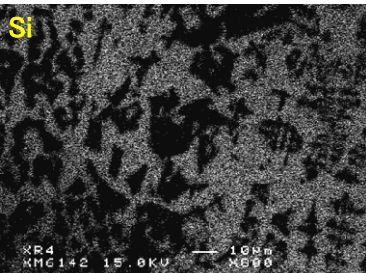
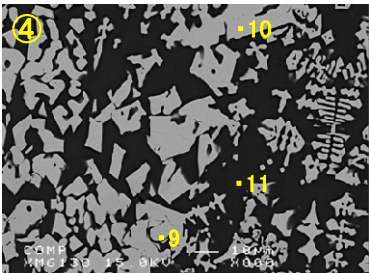
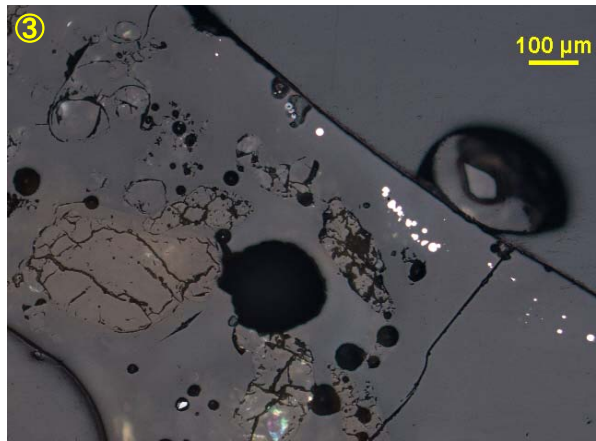
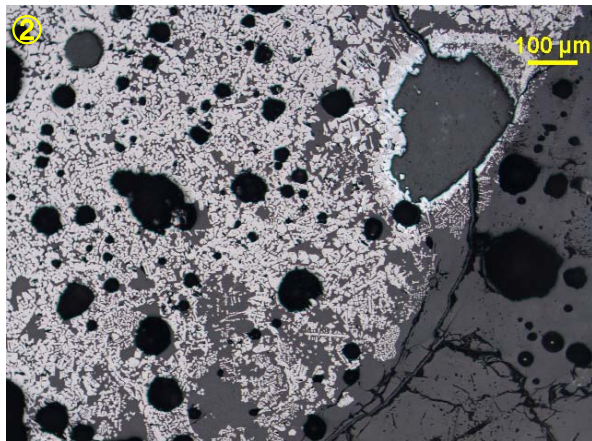
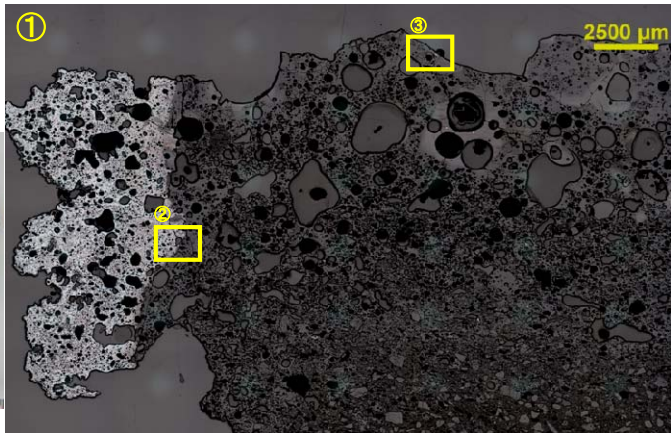


Photo.12 鍛造剥片・粒状滓の顕微鏡組織

KYS-20
羽口(大口径)
①マクロ組織
②先端付着滓部拡大:マグネタイト
③外面表層ガラス質滓、微小金属鉄粒散在



定量分析値					
Element	9	10	11		
Na ₂ O	0.147	0.182	1.854		
MgO	-	0.905	0.152		
Al ₂ O ₃	2.847	4.904	11.642		
SiO ₂	0.389	0.050	73.885		
P ₂ O ₅	0.008	-	0.896		
S	0.001	-	-		
K ₂ O	0.018	0.012	3.186		
CaO	-	-	2.620		
TiO ₂	0.064	0.193	0.174		
Cr ₂ O ₃	0.031	0.054	0.024		
MnO	0.015	0.058	0.026		
FeO	83.984	86.067	5.661		
SrO	0.027	-	0.435		
ZrO ₂	0.038	-	-		

Element	87.569	92.425	100.555		

Element	12	13			
F	-	0.134			
Na ₂ O	1.354	-			
MgO	0.481	-			
Al ₂ O ₃	11.967	0.035			
SiO ₂	68.020	101.677			
P ₂ O ₅	0.021	0.018			
S	-	0.012	Element	3	4
K ₂ O	3.816	0.008	Cu	0.085	0.155
CaO	1.396	-	Pb	-	0.087
TiO ₂	0.318	0.014	Zn	0.040	-
Cr ₂ O ₃	-	0.062	Fe	93.732	94.737
MnO	0.073	-	As	0.019	0.016
FeO	15.473	0.344	Ag	0.014	0.002
SrO	0.392	0.506	O	0.002	0.095
ZrO ₂	0.047	-	S	-	0.001

Element	103.358	102.754	Total	93.892	95.093

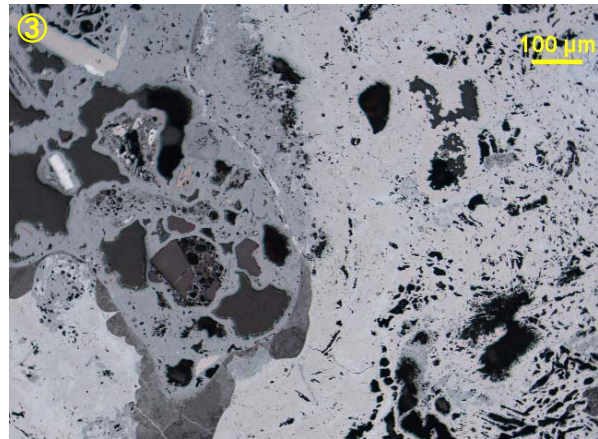
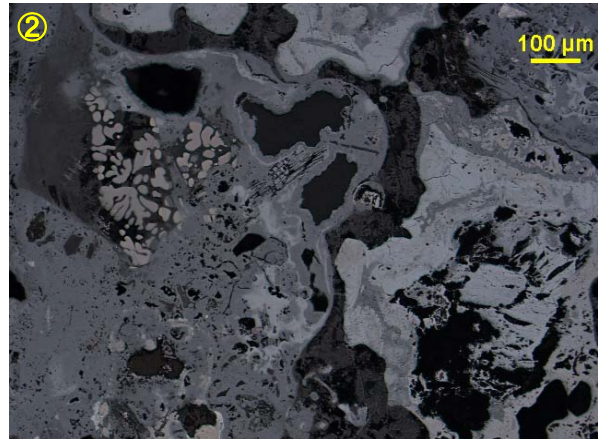
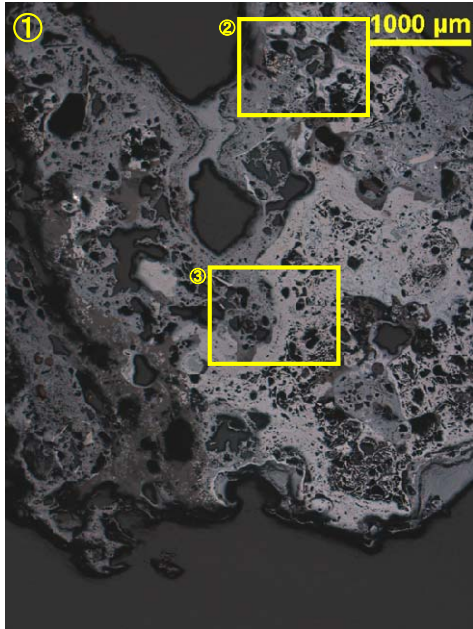
滓部の反射電子像 (COMP) および特性X線像

Photo.13 羽口の顕微鏡組織・EPMA調査結果

KYS-21

椀形鍛冶滓(含鉄)

①~③不定形灰色部:
錆化鉄、金属組織痕跡不明瞭、滓部:ウスタト、鍛造剥片付着



KYS-22

鉄塊系遺物

④マクロ組織
⑤⑥錆化鉄部、金属組織痕跡不明瞭

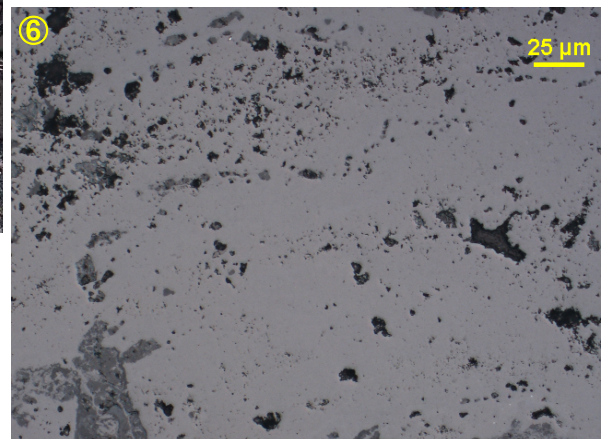
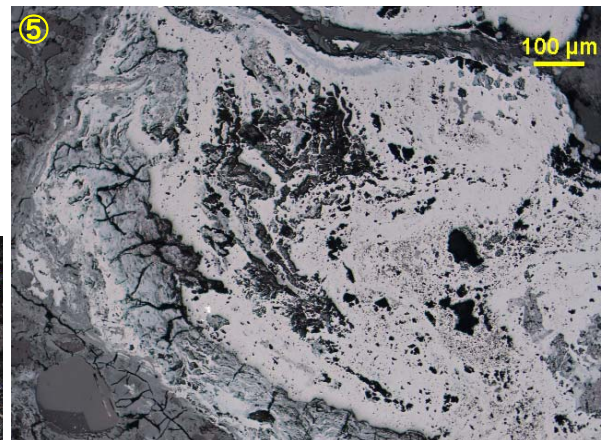
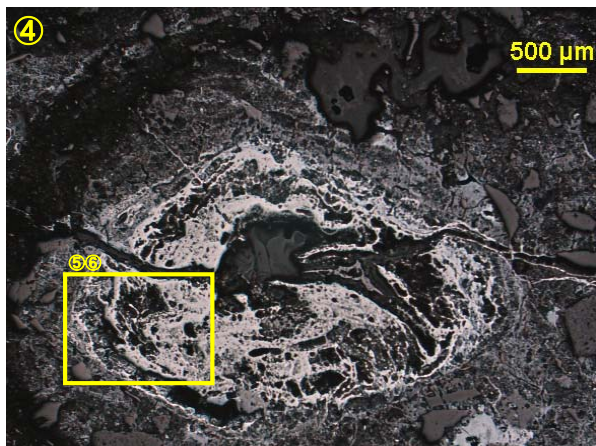
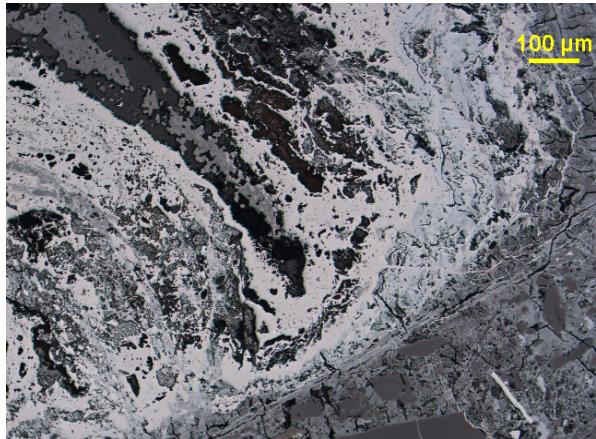


Photo.14 椀形鍛冶滓・鉄塊系遺物の顕微鏡組織



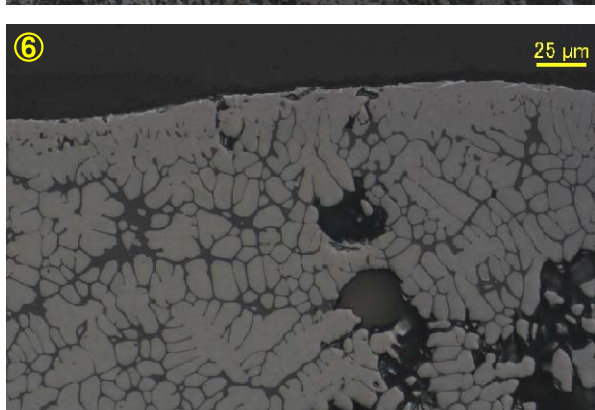
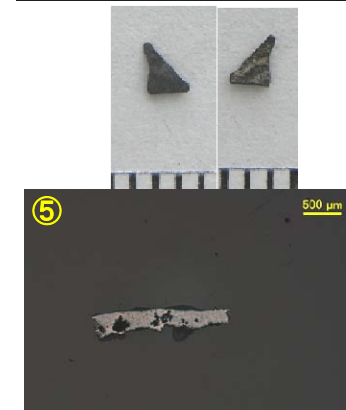
KYS-23(1)-1
 鍛造剥片様遺物
 ①マクロ組織
 ②錆化鉄:ねずみ鑄鉄組織痕跡



KYS-23(1)-2
 鍛造剥片様遺物
 ③マクロ組織
 ④錆化鉄



KYS-23(2)-1
 鍛造剥片様遺物
 ⑤マクロ組織
 ⑥上面明白色層:ヘマタイト
 滓部:ウスタイト



KYS-23(2)-2
 鍛造剥片
 ⑦マクロ組織
 ⑧明白色層:ヘマタイト
 灰褐色層:マグネタイト
 灰色層:ウスタイト

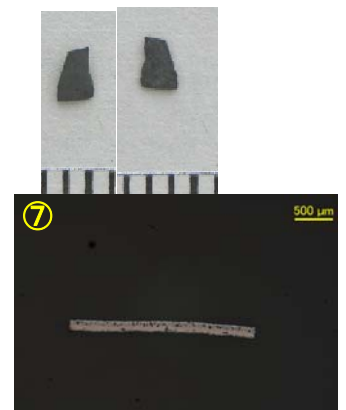


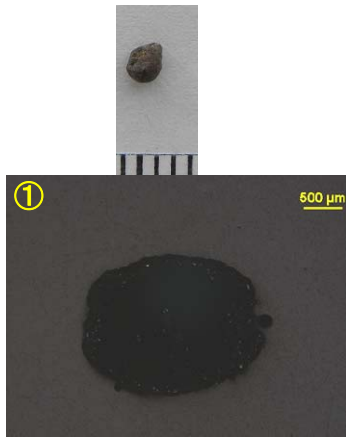
Photo.15 鍛造剥片の顕微鏡組織

KYS-23(2)-3

粒状滓様遺物

①マクロ組織

②土砂塊

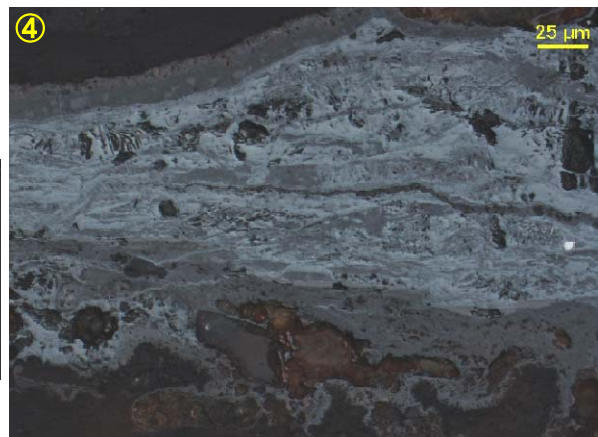


KYS-23(3)-1

鍛造剥片様遺物

③マクロ組織

④錆化鉄

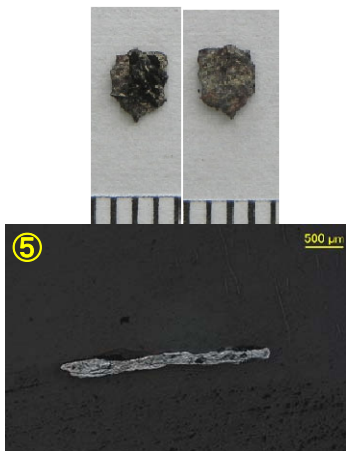


KYS-23(4)-1

鍛造剥片様遺物

⑤マクロ組織

⑥錆化鉄



KYS-23(5)-1

鍛造剥片

⑦マクロ組織

⑧明白色層:ヘマタイト

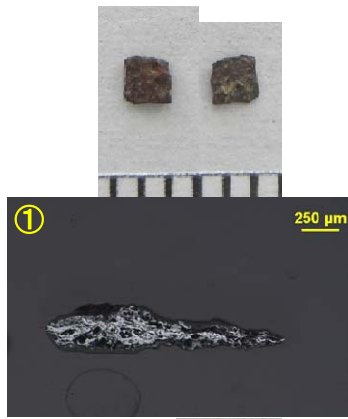
灰褐色層:マグネタイト

灰色層:ウスタイト



Photo.16 鍛造剥片の顕微鏡組織

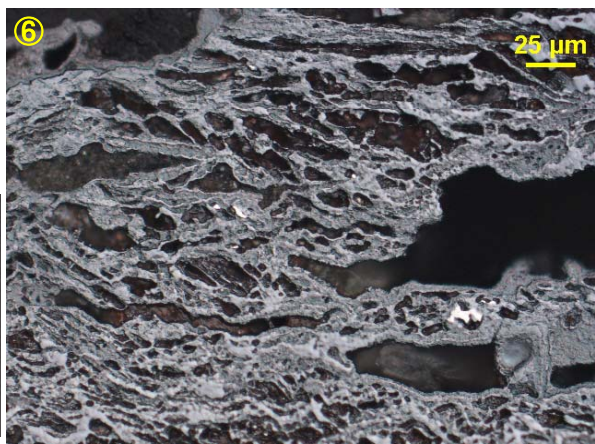
KYS-23(5)-2
 鍛造剥片様遺物
 ①マクロ組織
 ②錆化鉄、ねずみ鑄鉄組織痕跡



KYS-23(5)-3
 鍛造剥片様遺物
 ③マクロ組織
 ④錆化鉄、金属組織痕跡不明瞭



KYS-23(6)-1
 鍛造剥片様遺物
 ⑤マクロ組織
 ⑥錆化鉄、白鑄鉄組織痕跡



KYS-23(6)-2
 鍛造剥片様遺物
 ⑦マクロ組織
 ⑧錆化鉄、白鑄鉄組織痕跡

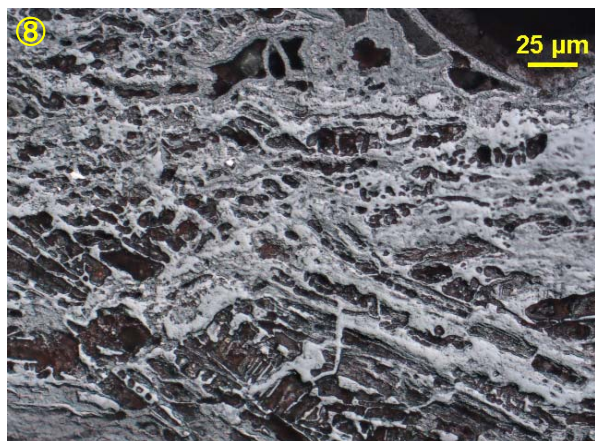
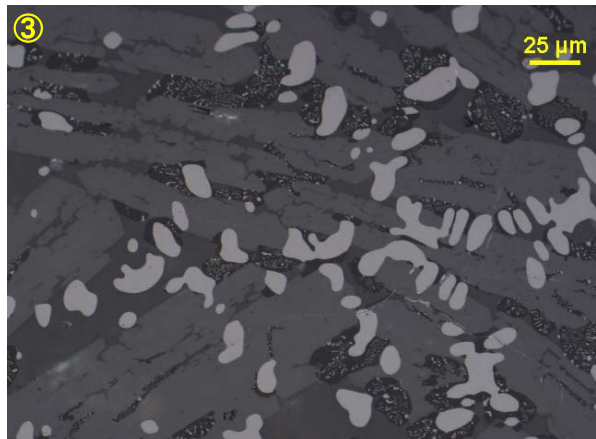
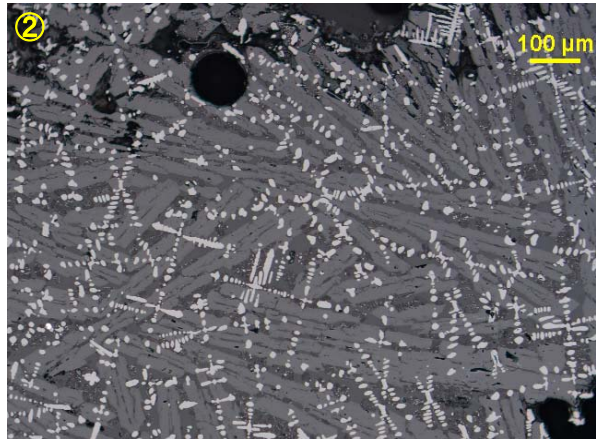
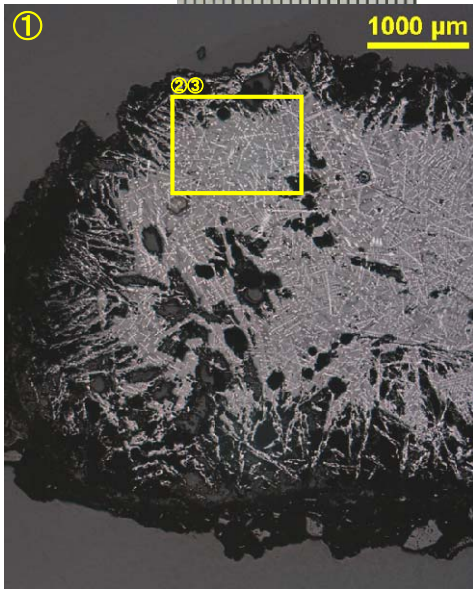


Photo.17 鍛造剥片の顕微鏡組織

KYS-24
鍛冶滓
①～③滓部:ウスタイト・ファイ
ライト



KYS-25
椀形鍛冶滓
④～⑥滓部:ウスタイト・ファイ
ライト

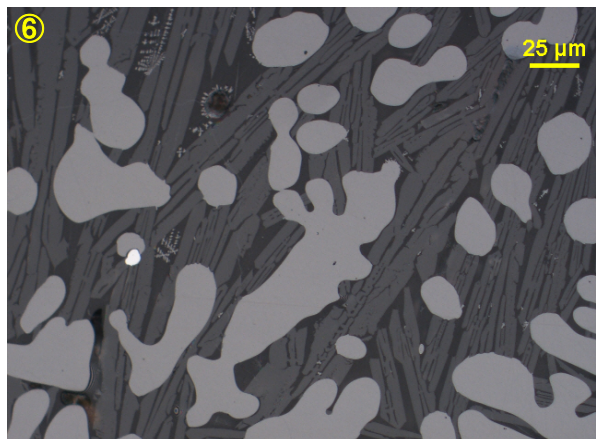
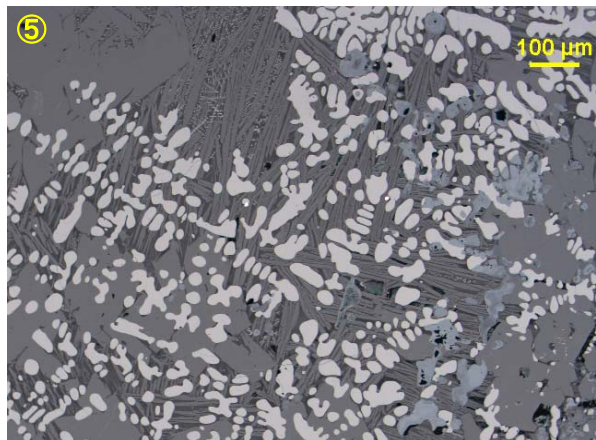
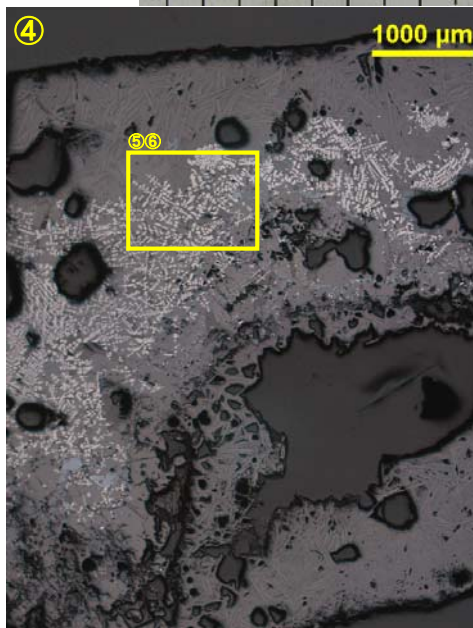
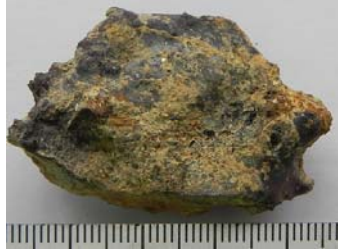
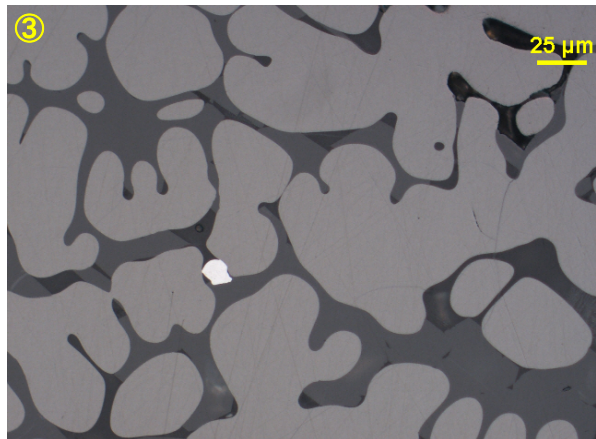
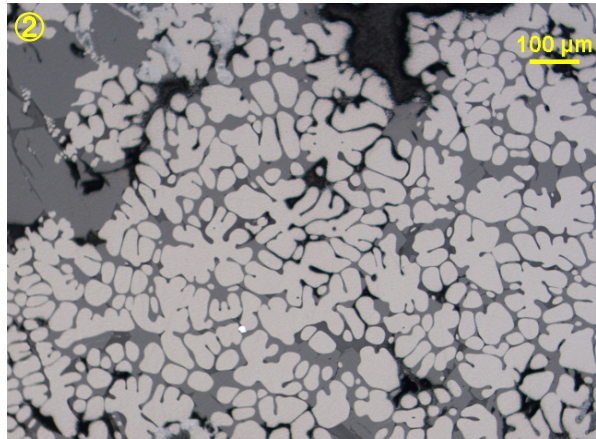
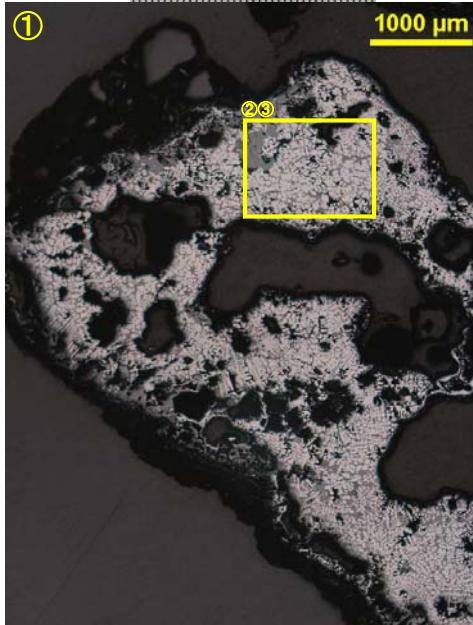


Photo.18 鍛冶滓・椀形鍛冶滓の顕微鏡組織

KYS-26
 椀形鍛冶滓
 ①～③滓部:ウスタイト・ファヤライト



KYS-27
 鍛冶滓
 ④表層:鍛造剥片付着
 滓部:微細ウスタイト
 ⑤鍛造剥片拡大
 ⑥滓部拡大

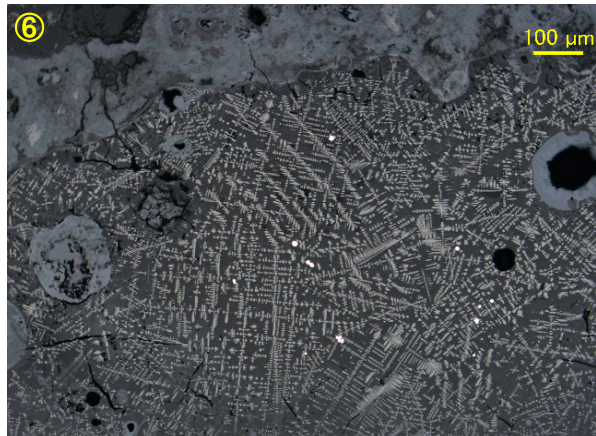
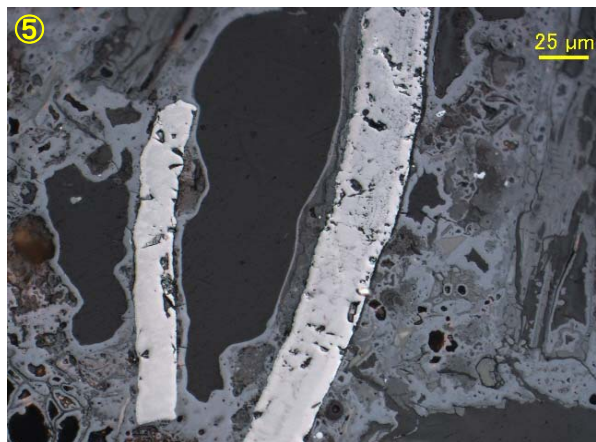
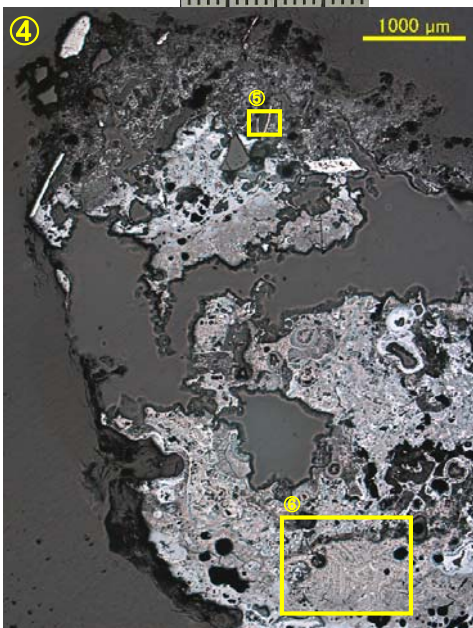
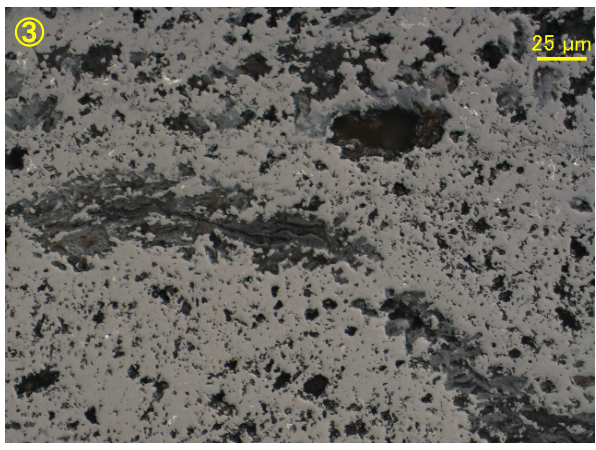
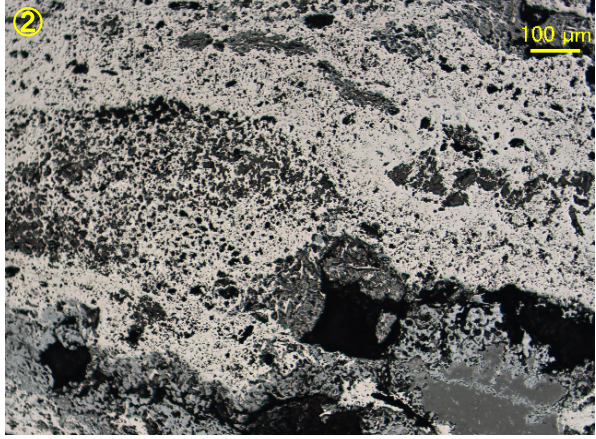
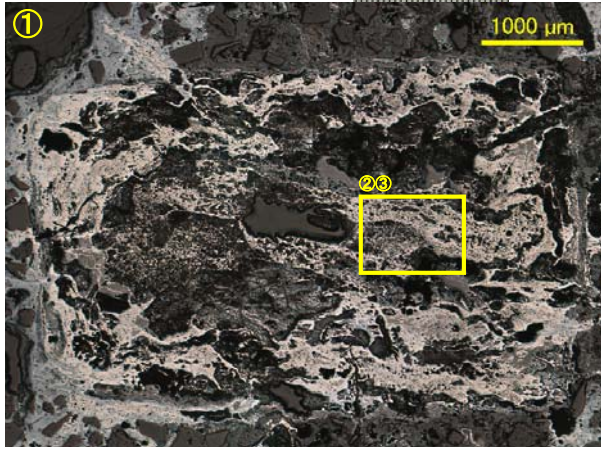


Photo.19 椀形鍛冶滓・鍛冶滓の顕微鏡組織

KYS-28
 鉄製品(棒状)
 ①マクロ組織
 ②③錆化鉄:金属組織痕跡不明瞭



KYS-29
 椀形鍛冶滓
 ④～⑥滓部:ウスタイト・ファライト

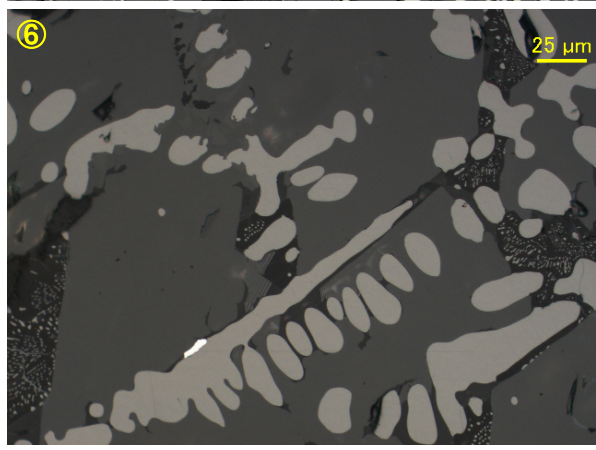
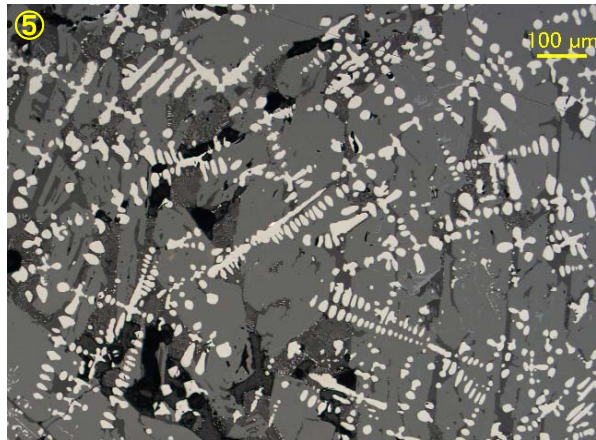
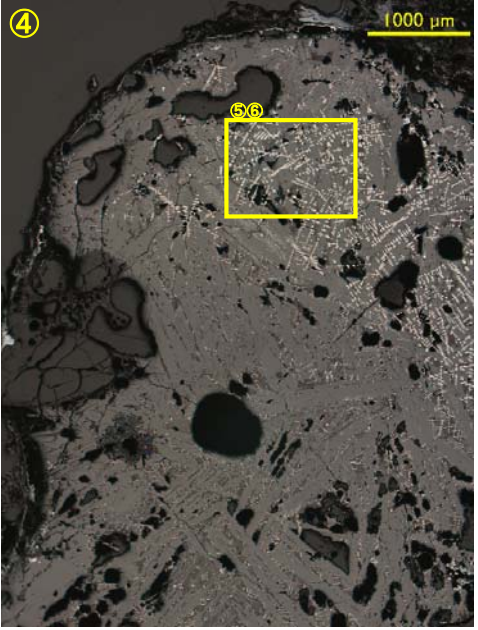
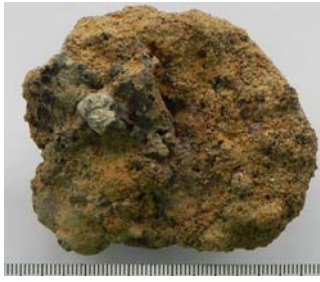
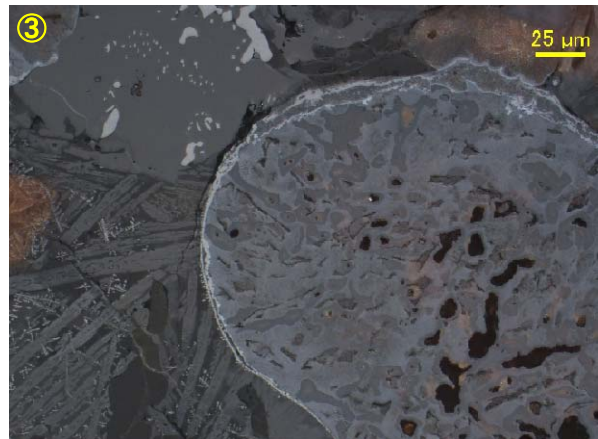
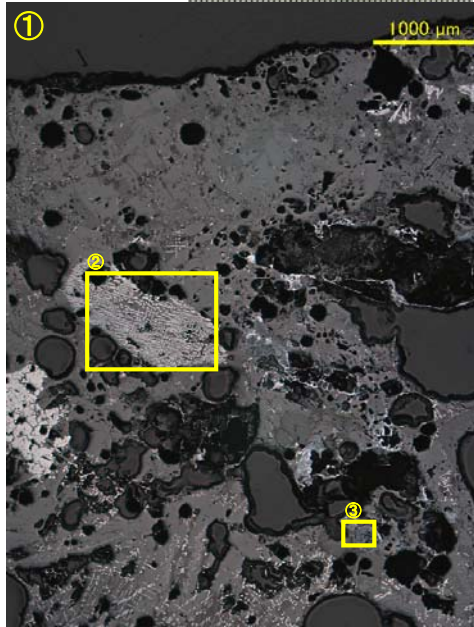
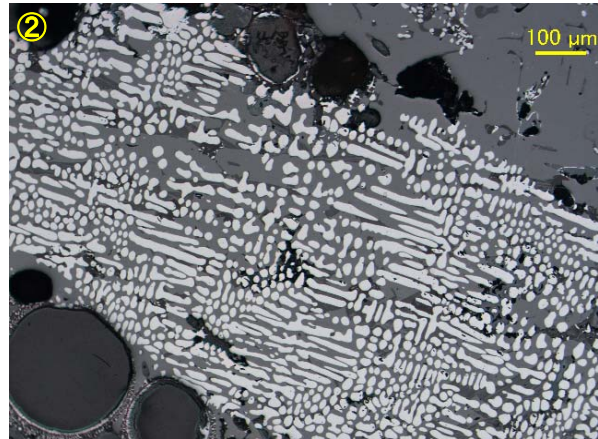


Photo.20 鉄製品・椀形鍛冶滓の顕微鏡組織

KYS-30
 椀形鍛冶滓
 ①～③滓部:ウスタイト・ファヤライト、青灰色部:錆化鉄:亜共析組織痕跡



KYS-31
 鉄製品(釘)
 ④マクロ組織
 ⑤⑥フェライト単相～亜共析組織
 Photo.22①②同上

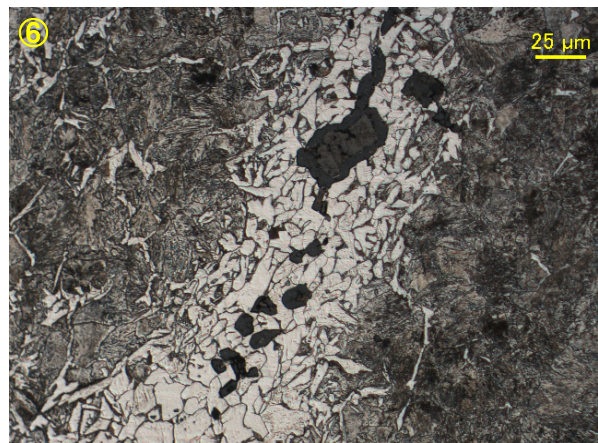
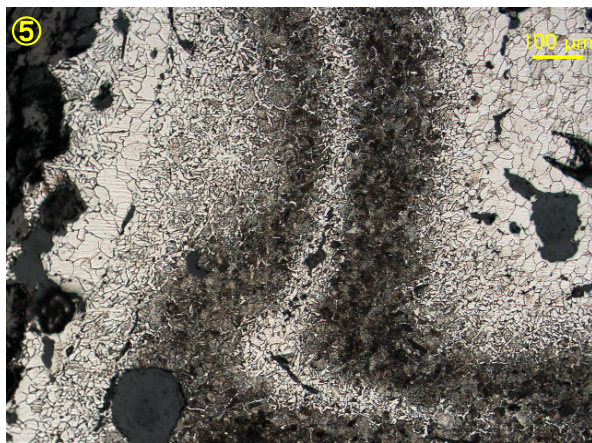


Photo.21 椀形鍛冶滓・鉄製品の顕微鏡組織

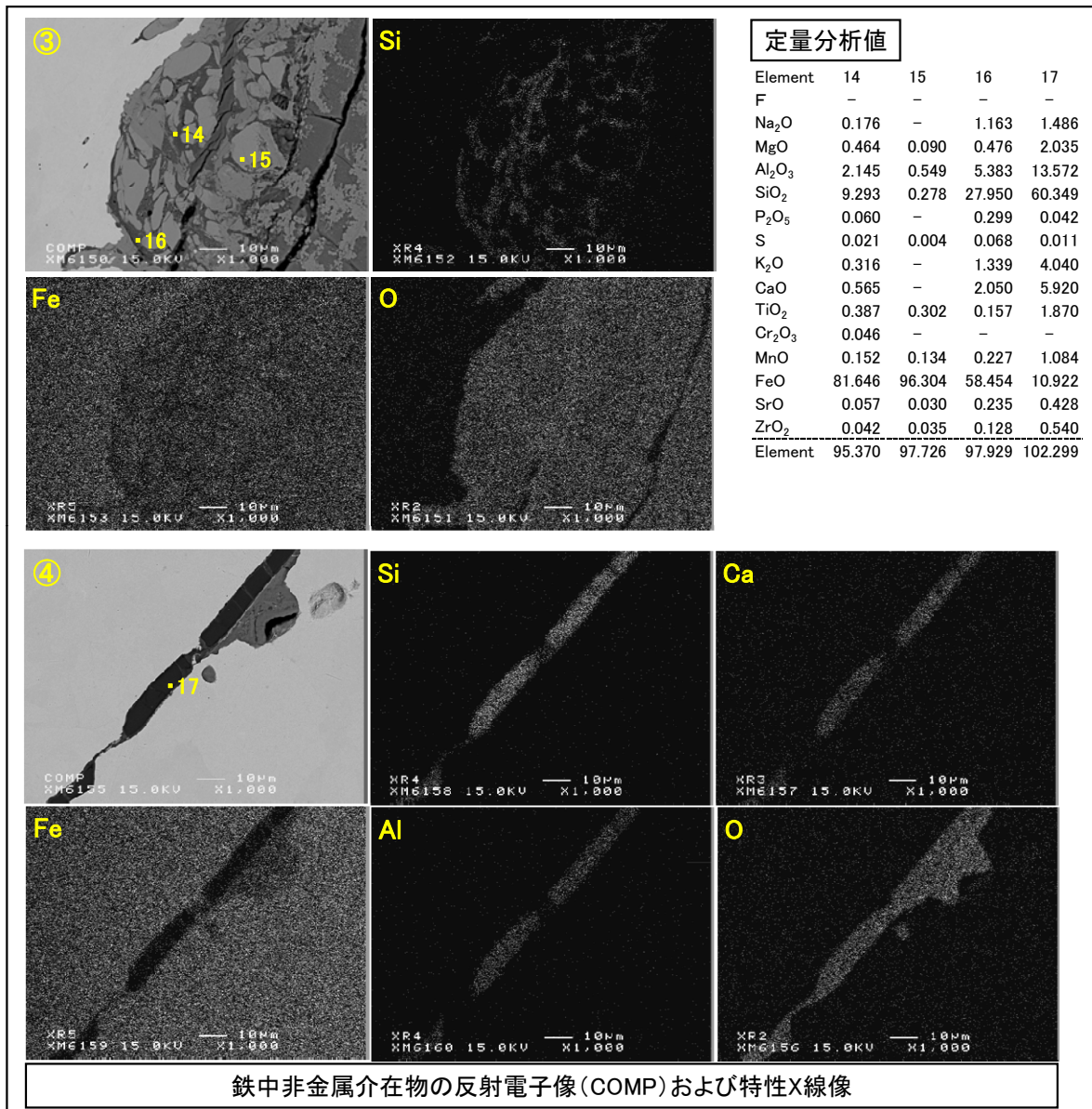
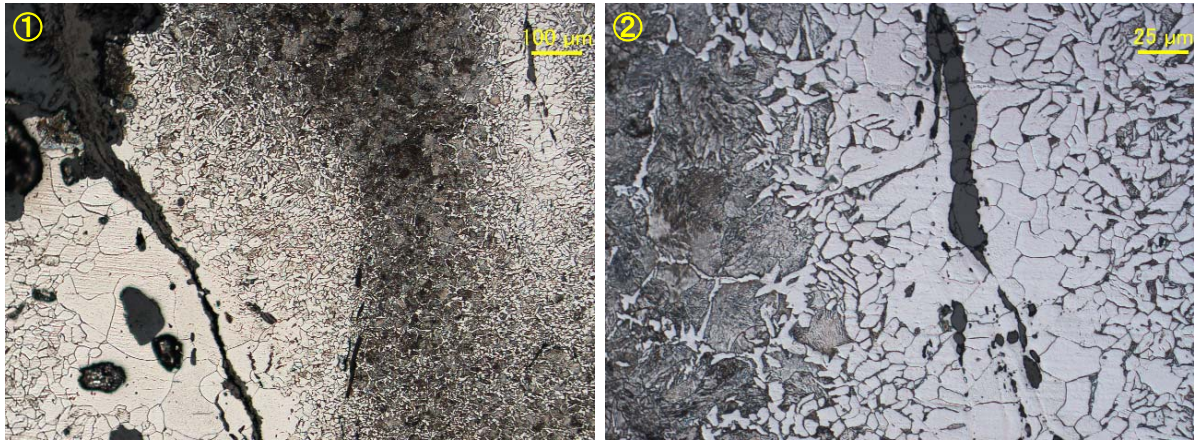
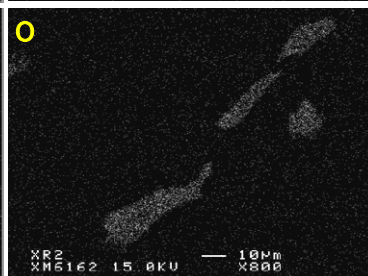
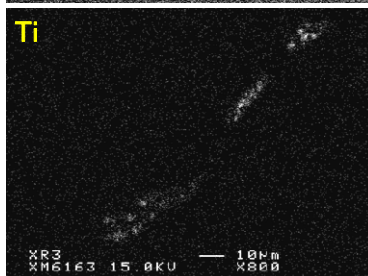
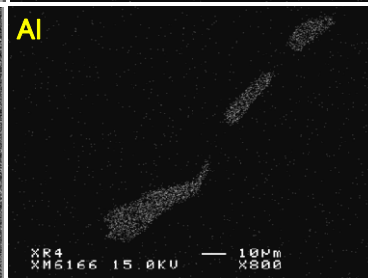
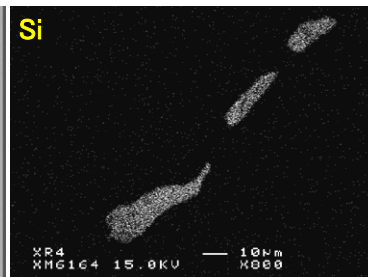
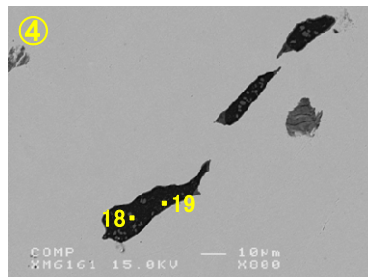
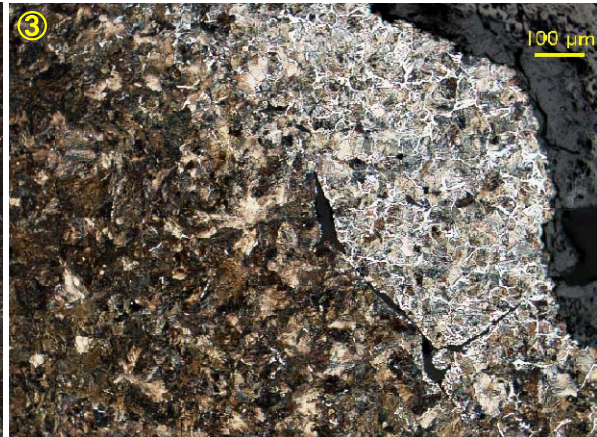
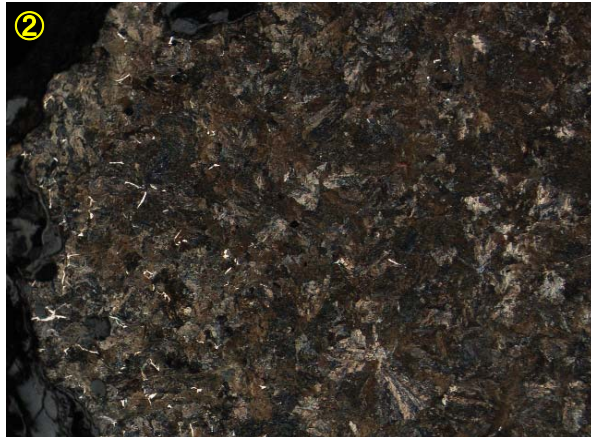
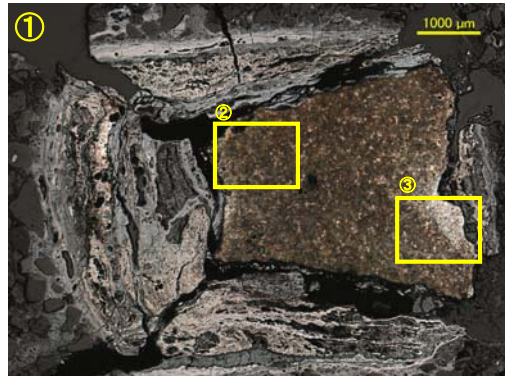


Photo.22 鉄製品(釘)(KYS-31)の顕微鏡組織・EPMA調査結果

KYS-32
鉄製品(棒状)
①マクロ組織
②③亜共析組織



定量分析値

Element	18	19
F	0.167	-
Na ₂ O	0.394	1.300
MgO	6.566	4.850
Al ₂ O ₃	8.029	18.051
SiO ₂	12.247	53.403
P ₂ O ₅	-	-
S	0.002	0.017
K ₂ O	1.018	4.577
CaO	1.106	5.928
TiO ₂	66.759	5.694
Cr ₂ O ₃	0.055	-
MnO	1.197	2.196
FeO	2.354	1.922
SrO	0.132	0.308
ZrO ₂	4.664	2.960
Element	104.620	101.206

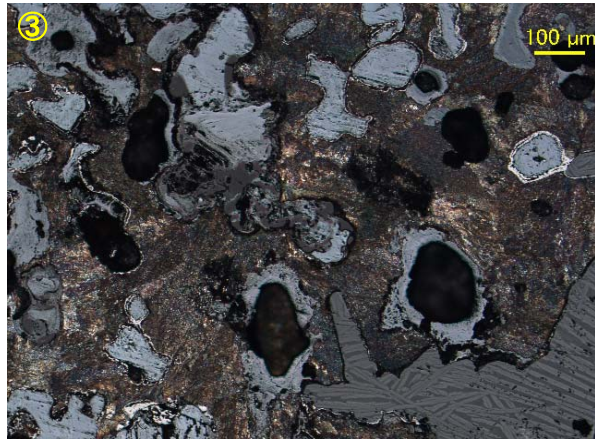
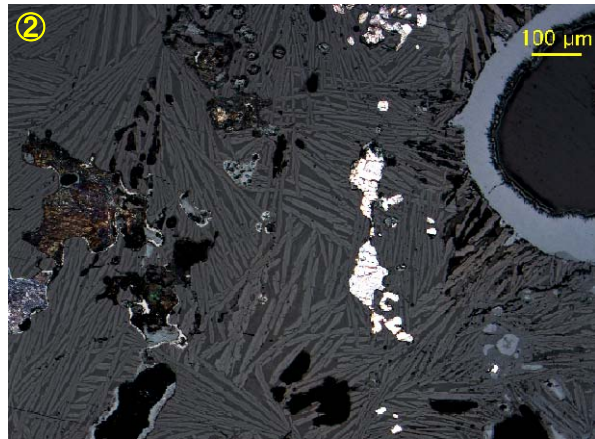
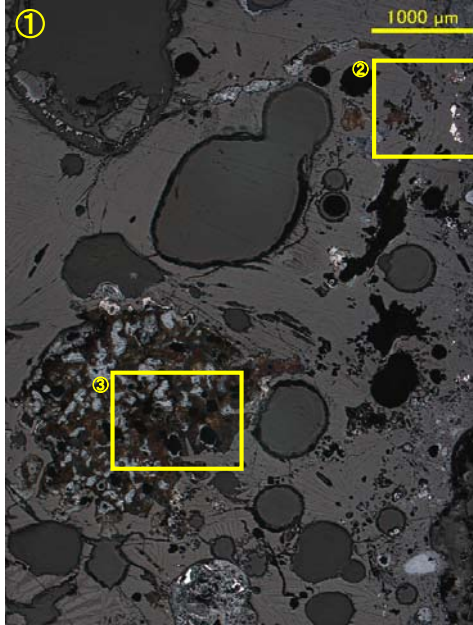
鉄中非金属介在物の反射電子像(COMP)および特性X線像

Photo.23 鉄製品の顕微鏡組織・EPMA調査結果

KYS-33

椀形鍛冶滓

①～③滓部:ファヤライト、金属鉄部 ナイトレッチ フェライト
単相～共析組織



KYS-34

椀形鍛冶滓(含鉄)

④マクロ組織

⑤⑥金属鉄部:共析組織

滓部:ウスタイト・ファヤライト

Photo.25 ①②金属鉄部:

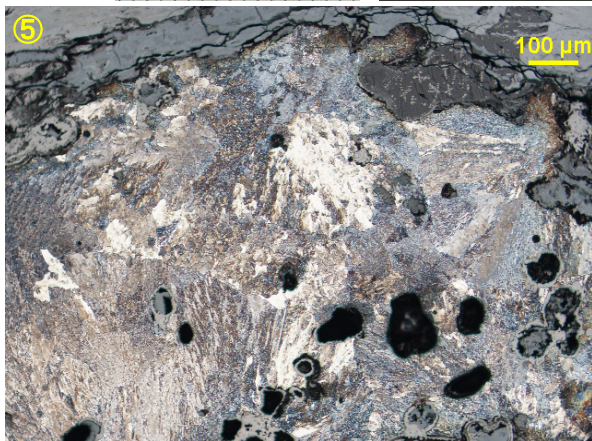
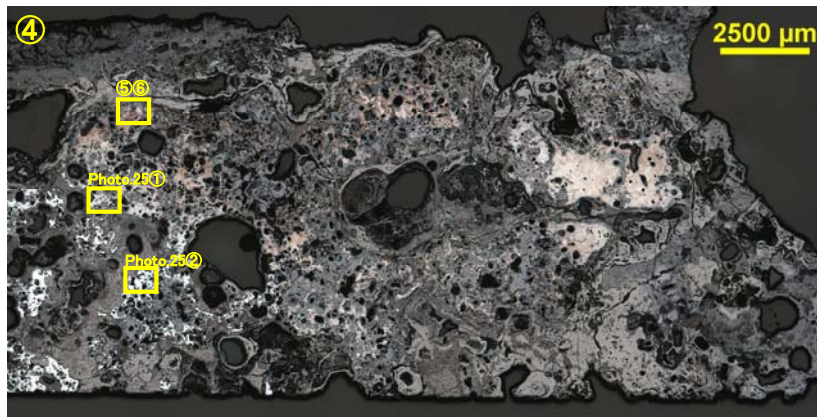
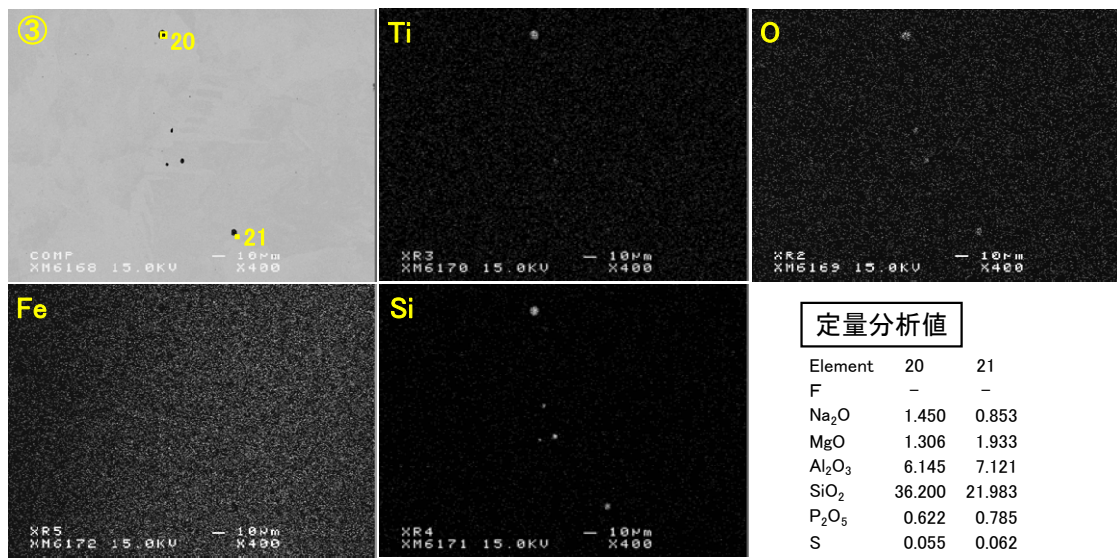
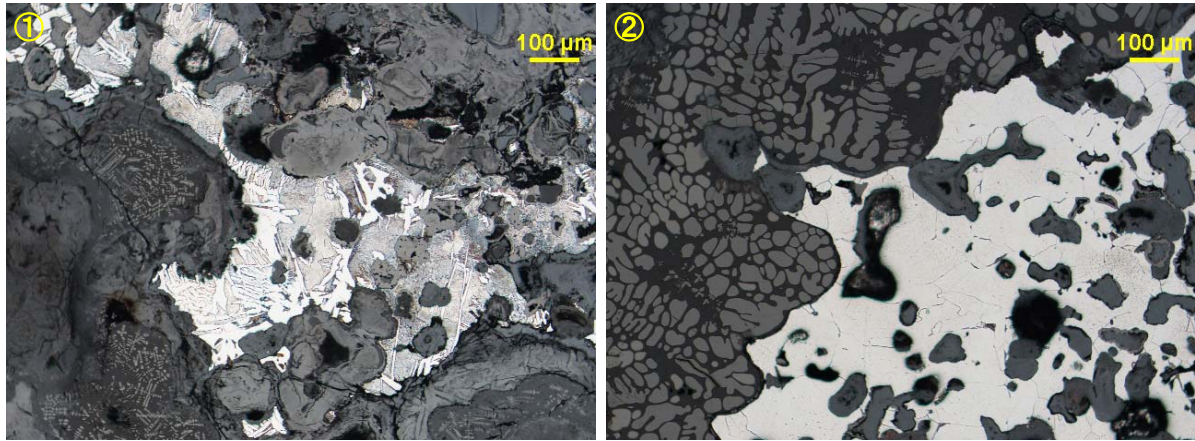


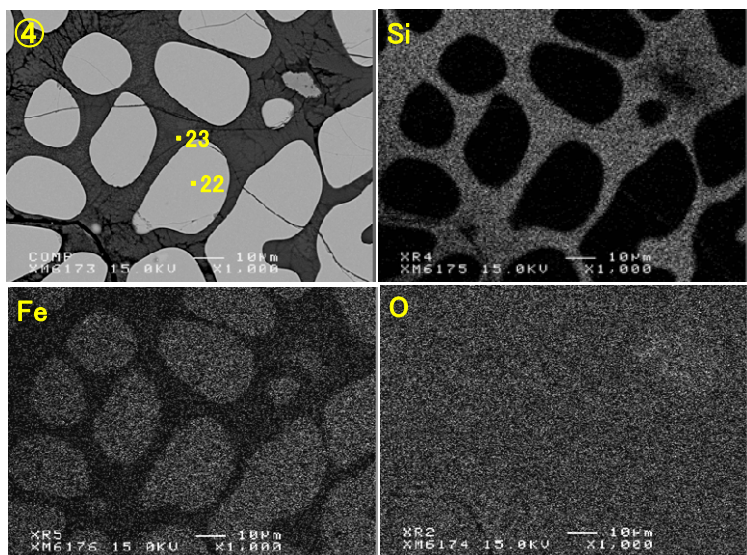
Photo.24 椀形鍛冶滓の顕微鏡組織



鉄中非金属介在物の反射電子像 (COMP) および特性X線像

定量分析値

Element	20	21
F	-	-
Na ₂ O	1.450	0.853
MgO	1.306	1.933
Al ₂ O ₃	6.145	7.121
SiO ₂	36.200	21.983
P ₂ O ₅	0.622	0.785
S	0.055	0.062
K ₂ O	3.607	1.305
CaO	5.097	6.315
TiO ₂	9.918	10.906
Cr ₂ O ₃	0.045	-
MnO	1.885	1.624
FeO	32.026	51.539
SrO	0.245	0.190
ZrO ₂	1.891	2.378
Element	100.492	106.994

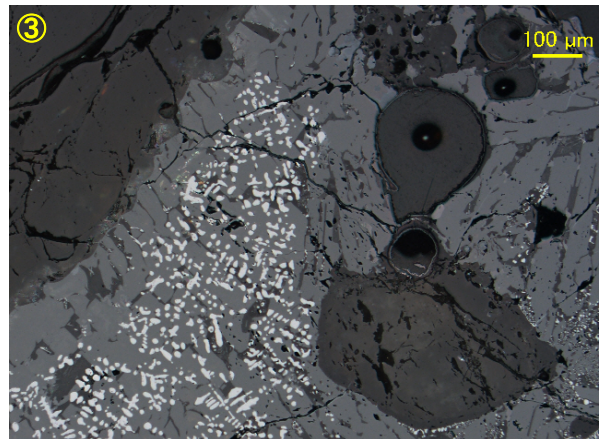
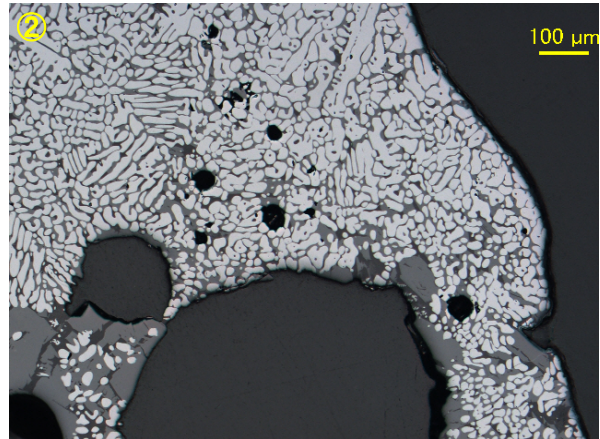
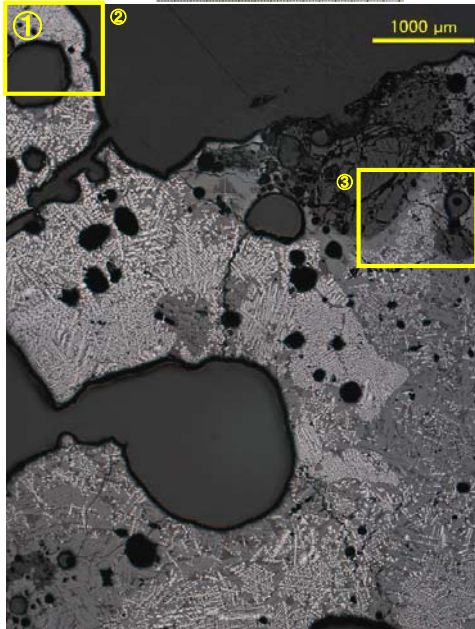


滓部の反射電子像 (COMP) および特性X線像

Element	22	23
F	-	-
Na ₂ O	-	1.182
MgO	0.701	1.300
Al ₂ O ₃	0.299	7.331
SiO ₂	0.160	42.236
P ₂ O ₅	-	0.640
S	0.004	0.035
K ₂ O	0.011	3.292
CaO	-	6.263
TiO ₂	0.204	0.077
Cr ₂ O ₃	-	0.055
MnO	0.179	0.278
FeO	97.146	38.905
SrO	0.031	0.295
ZrO ₂	-	0.044
Element	98.735	101.933

Photo.25 梔形鍛冶滓 (含鉄) (KYS-34) の顕微鏡組織・EPMA調査結果

KYS-35
 椀形鍛冶滓
 ①～③暗色粒:被熱砂粒、
 滓部:ウスタイト・ファヤライト



KYS-36
 椀形鍛冶滓
 ④滓部:ウスタイト・ファヤライト、
 暗色部:木炭破片
 ⑤滓部破片
 ⑥木炭破片、広葉樹:散

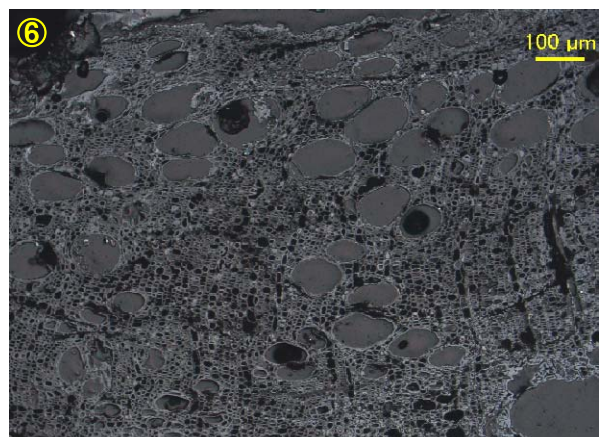
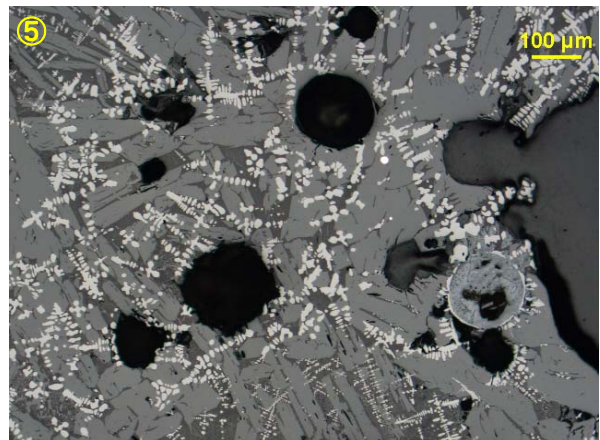
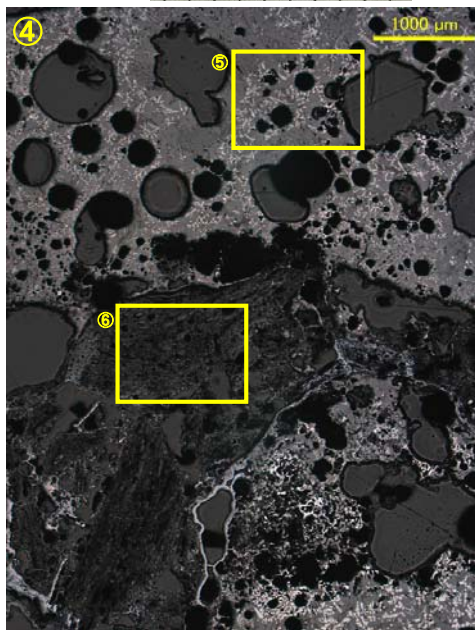
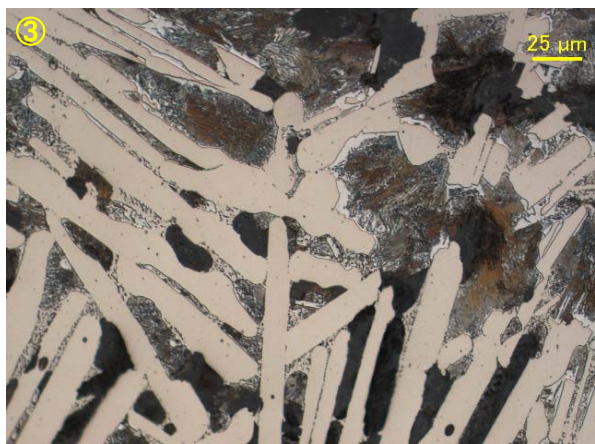
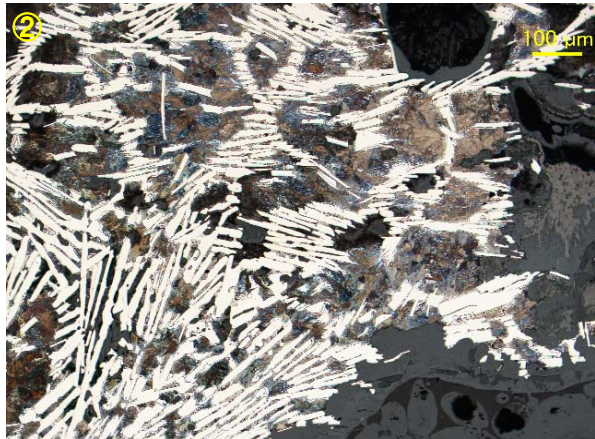
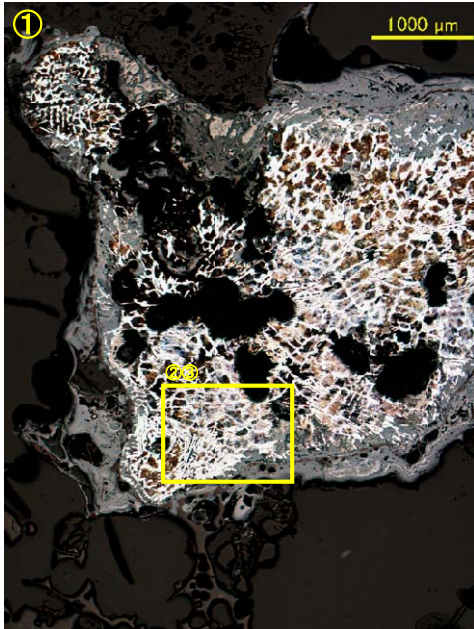


Photo.26 椀形鍛冶滓の顕微鏡組織

KYS-37
 ガラス質滓(含鉄)
 ①暗色部ガラス質滓、被熱砂粒散在、明色部金属鉄粒、ナイトレッチ亜共晶組成白鑄鉄



定量分析値		
Element	5	6
Cu	0.035	-
Pb	-	0.048
Sn	0.039	0.003
Zn	0.012	0.017
Fe	78.017	92.107
As	0.109	0.072
Sb	-	-
Ag	-	0.007
O	3.287	0.018
S	0.386	-
P	9.448	0.049
Ti	0.045	-
Mn	0.005	-
V	-	0.004
Total	91.383	92.325

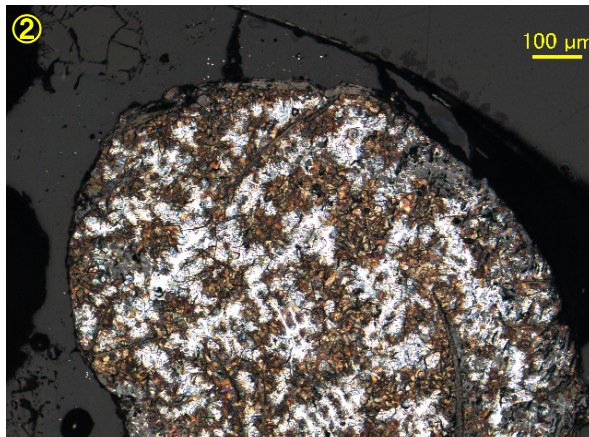
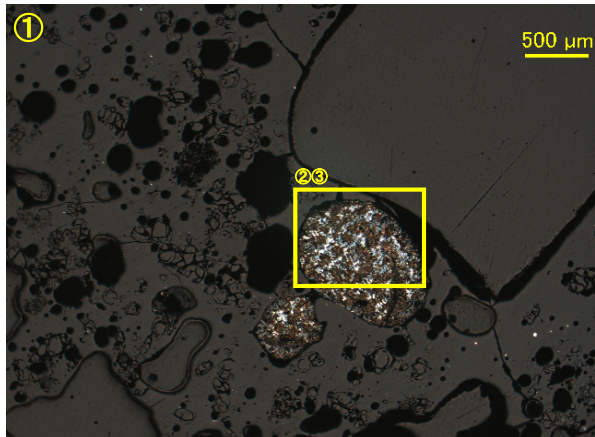
鉄中非金属介在物の反射電子像 (COMP) および特性X線像

Photo.27 ガラス質滓(含鉄)の顕微鏡組織・EPMA調査結果

KYS-38

ガラス質滓(含鉄)

①暗色部ガラス質滓、被熱砂粒散在、明色部金属鉄粒、ナイトレetch ねずみ鑄鉄組織



KYS-39

ガラス質滓

④暗色部ガラス質滓、被熱砂粒散在、明色部金属鉄粒、ナイトレetch 白鑄鉄組織

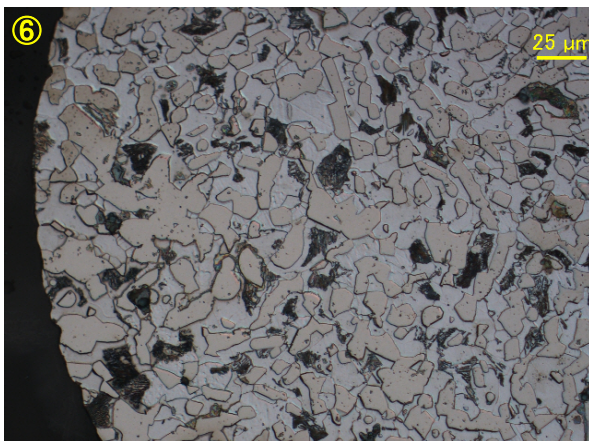
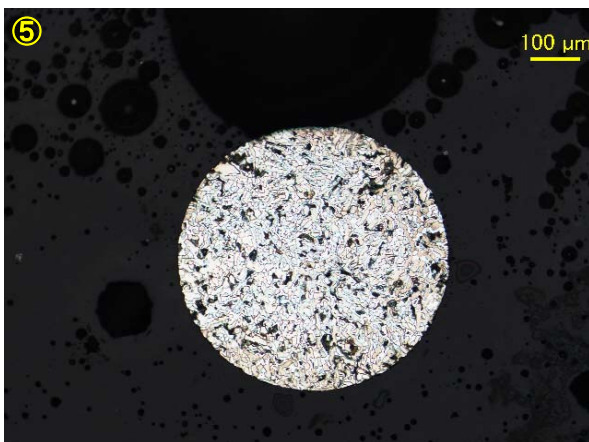
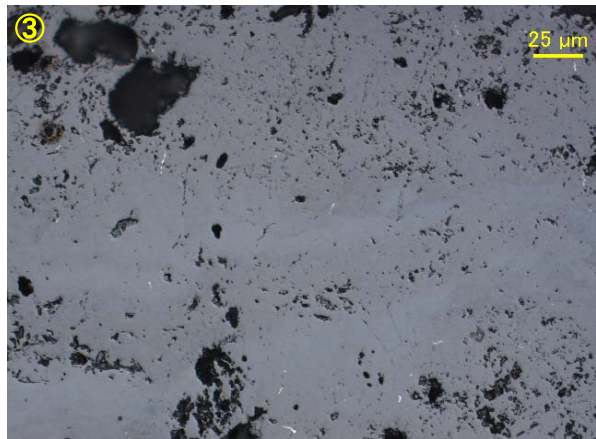
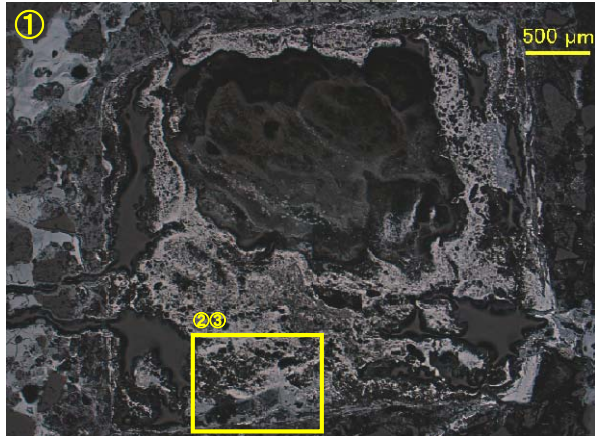


Photo.28 ガラス質滓の顕微鏡組織

KYS-40
 鉄製品(釘)
 ①マクロ組織
 ②③錆化鉄部拡大、亜共析組織痕跡



KYS-41
 鉄製品(釘)
 ④マクロ組織
 ⑤⑥錆化鉄部拡大、亜共析組織痕跡

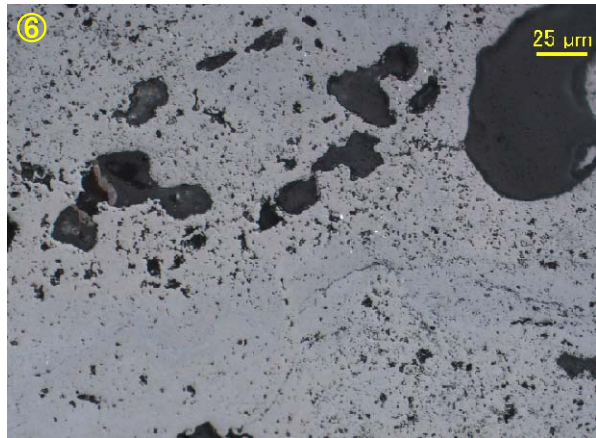
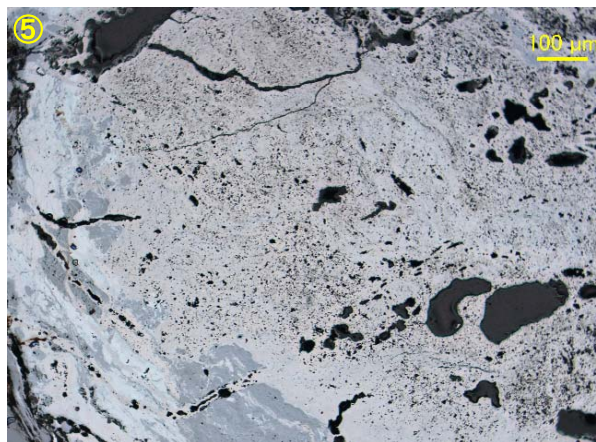
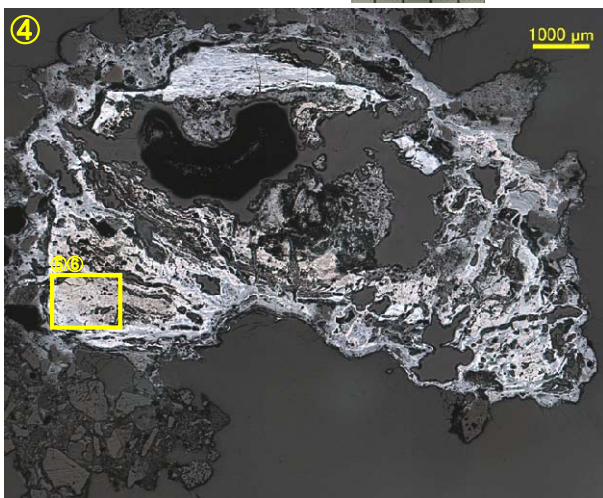
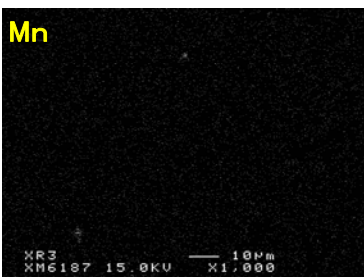
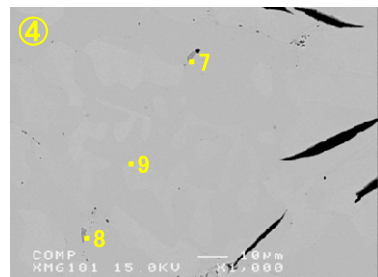
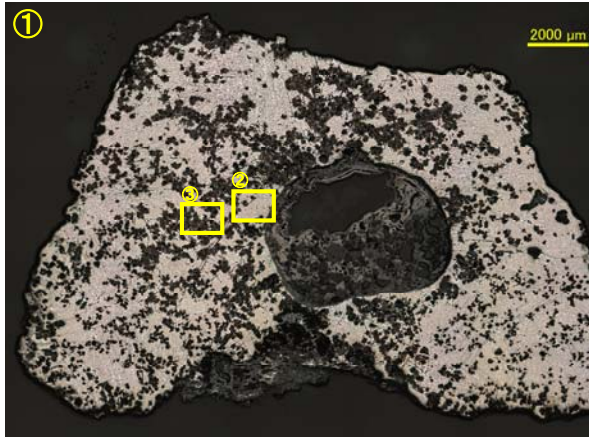
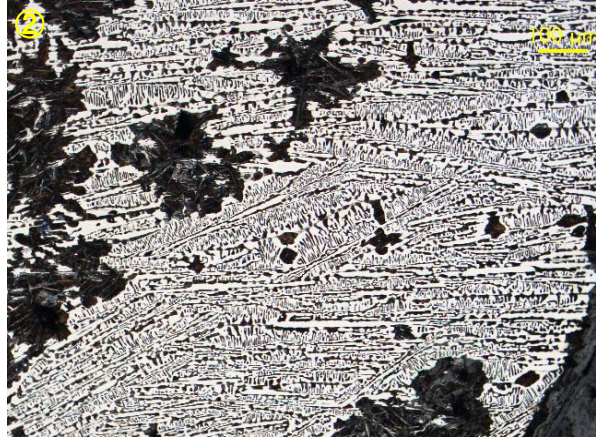


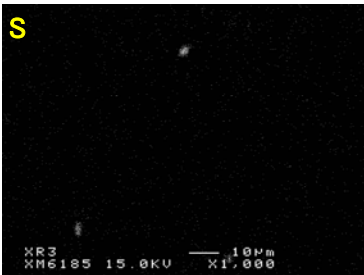
Photo.29 鉄製品(釘)の顕微鏡組織

KYS-42
鉄塊系遺物
①マクロ組織
②③斑鑄鉄組織



定量分析値

Element	7	8	9
Cu	0.105	0.100	0.014
Pb	-	-	0.004
Sn	-	-	0.004
Zn	-	-	-
Fe	44.902	47.420	77.854
As	-	0.077	-
Sb	-	-	-
Ag	0.035	0.007	-
O	-	-	0.373
S	31.821	25.582	0.150
P	0.087	1.224	9.217
Ti	2.617	0.267	0.027
Mn	12.218	27.635	-
V	0.108	-	0.029
Total	91.893	102.312	87.672



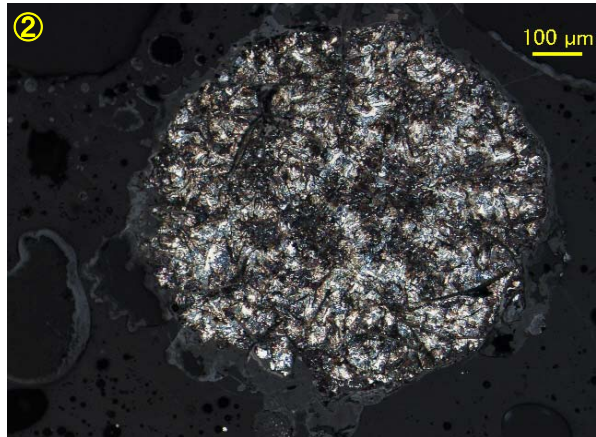
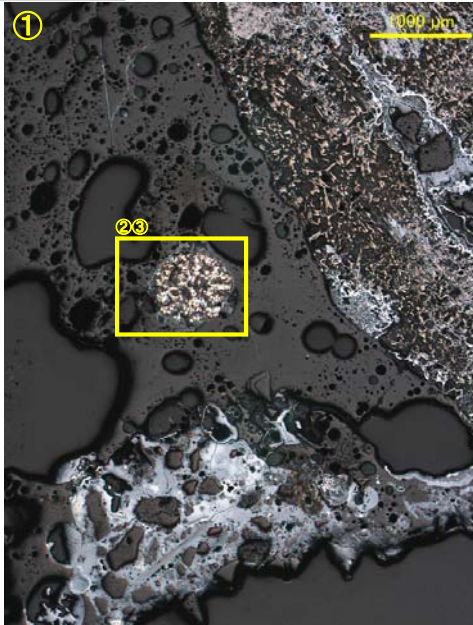
鉄中非金属介在物の反射電子像(COMP)および特性X線像

Photo.30 鉄製品(釘)の顕微鏡組織

KYS-43

ガラス質滓(含鉄)

①暗色部ガラス質滓、被熱砂粒散在、金属鉄粒、ナイトレッチねずみ鑄鉄組織



KYS-44

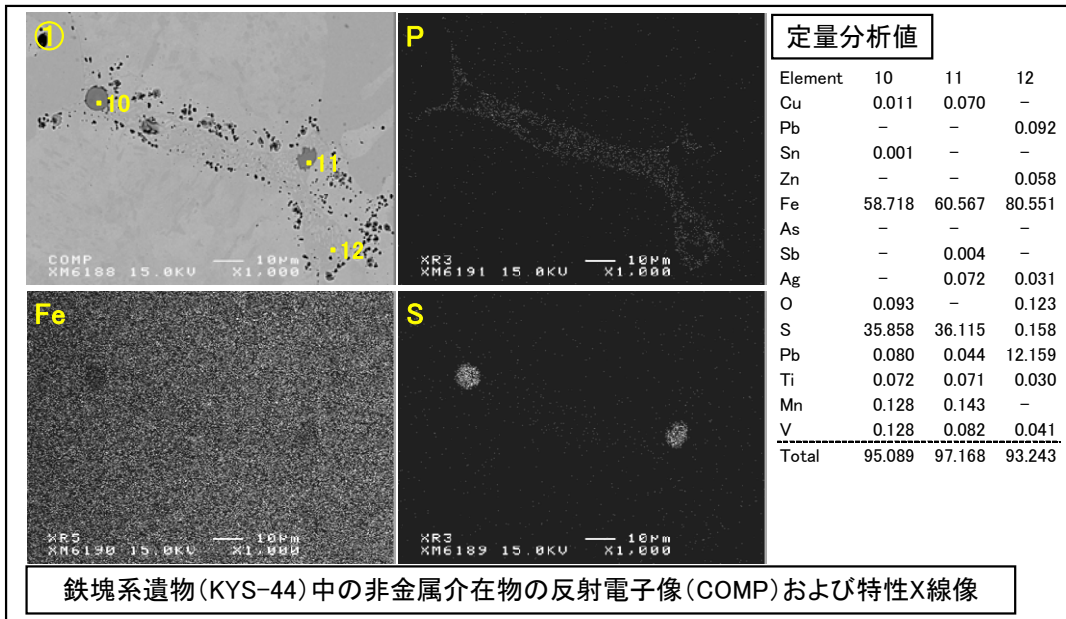
鉄塊系遺物

④マクロ組織

⑤⑥亜共晶組成白鑄鉄組織



Photo.31 ガラス質滓・鉄塊系遺物の顕微鏡組織



KYS-45
鉄塊系遺物
②マクロ組織
③～⑤金属鉄部:ナイタル etch 亜共晶組成白鑄鉄組織

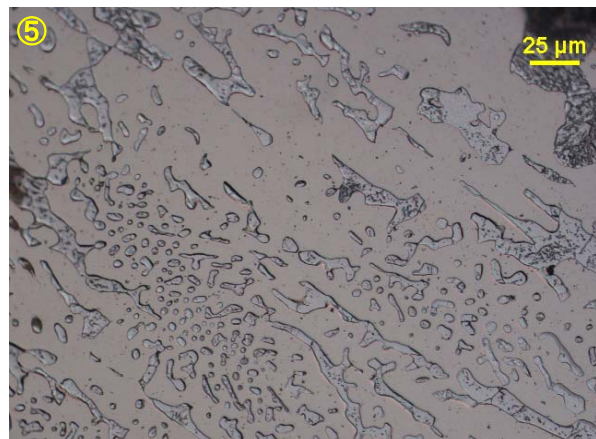
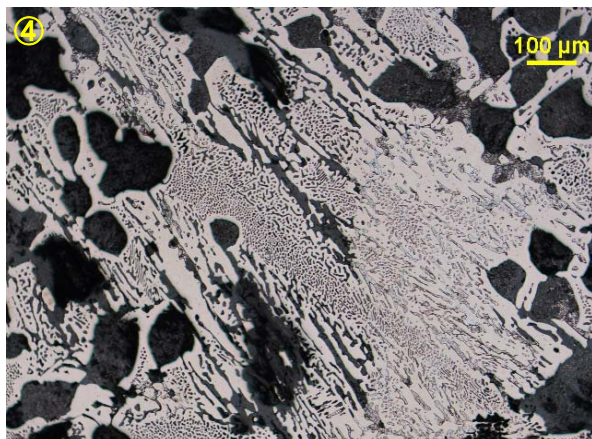
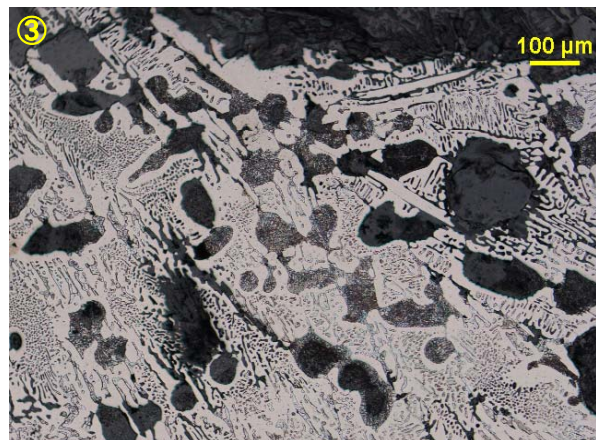
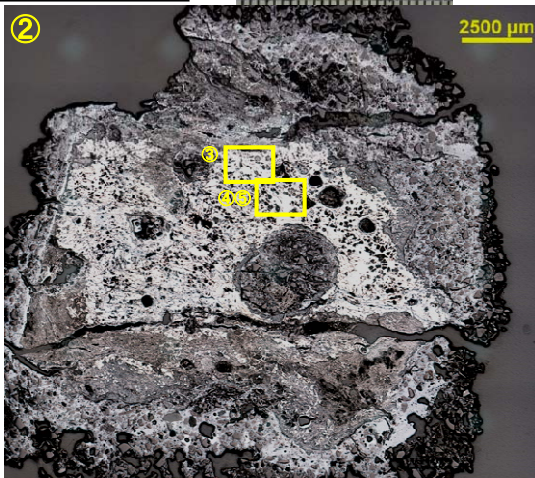
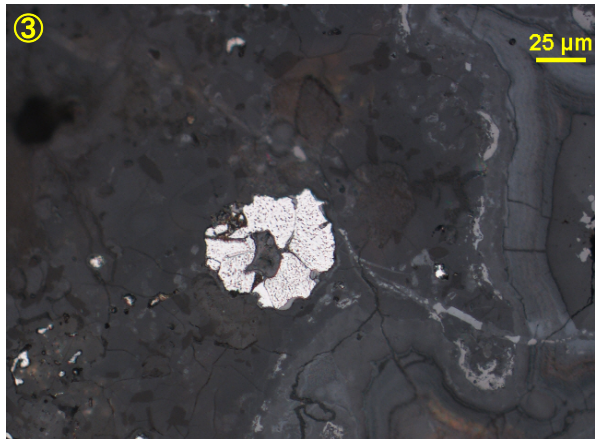
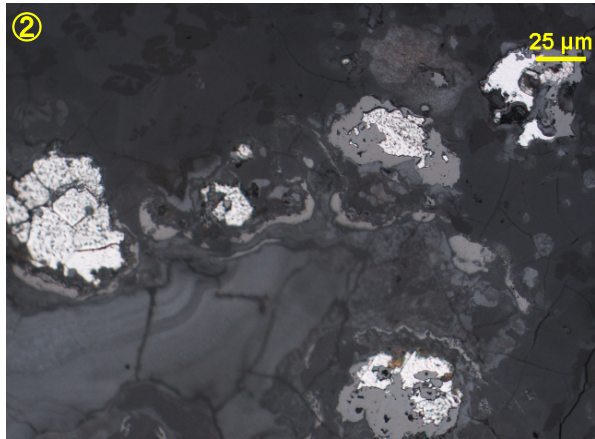
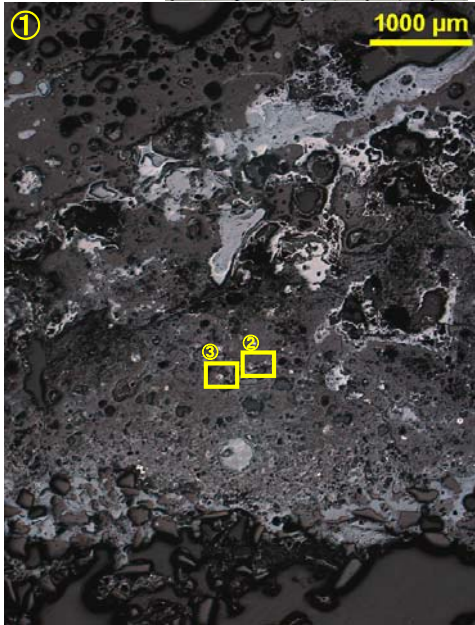


Photo.32 鉄塊系遺物のEPMA調査結果・顕微鏡組織

KYS-46
 ガラス質滓
 ①暗色部ガラス質滓
 微小金属鉄粒、锈化鉄散
 在
 ②③微小金属鉄粒拡大、
 ナイタルetch フェライト单相～



KYS-47
 ガラス質滓
 ④暗色部ガラス質滓
 锈化鉄粒、ねずみ鑄鉄組
 織

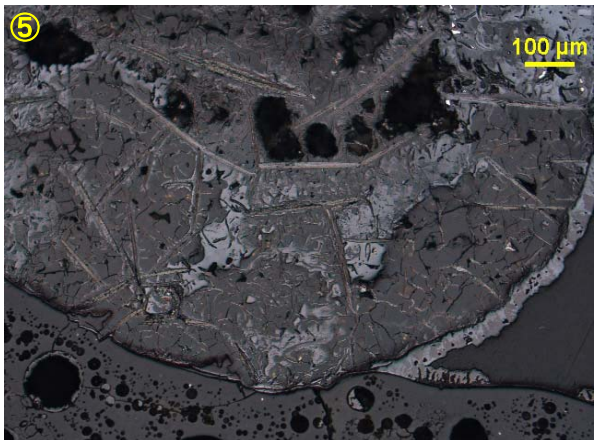
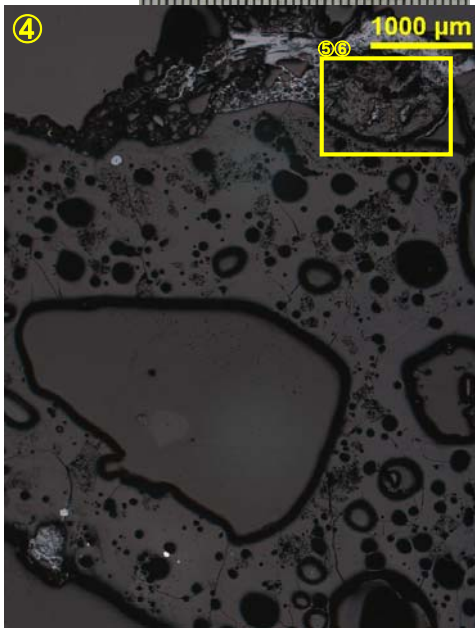
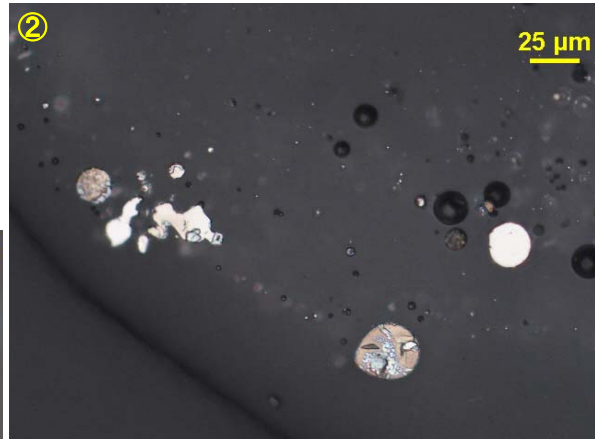
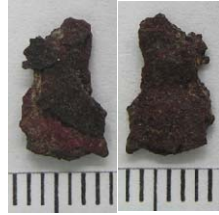


Photo.33 ガラス質滓の顕微鏡組織

KYS-48-1
 鍛造剥片様遺物
 ①マクロ組織
 ②暗色部:ガラス質滓、微小金属鉄粒 ナイタルetch
 フェライト单相~亜共析組織



KYS-48-2
 鍛造剥片様遺物
 ③マクロ組織
 ④錆化鉄:ねずみ鑄鉄



KYS-49
 椀形鍛冶滓
 ⑤上側滓部:ウスタイト・ファイライト、中央黒色部:木炭破片、広葉樹散孔材、下側:ガラス質滓、
 ⑥滓部拡大、⑦ガラス質滓、被熱砂粒、微小金属鉄散

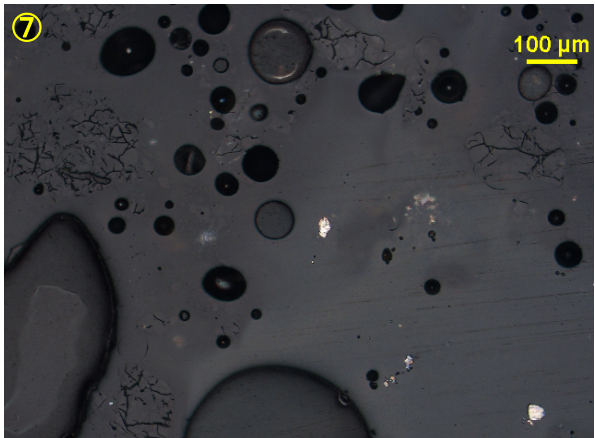
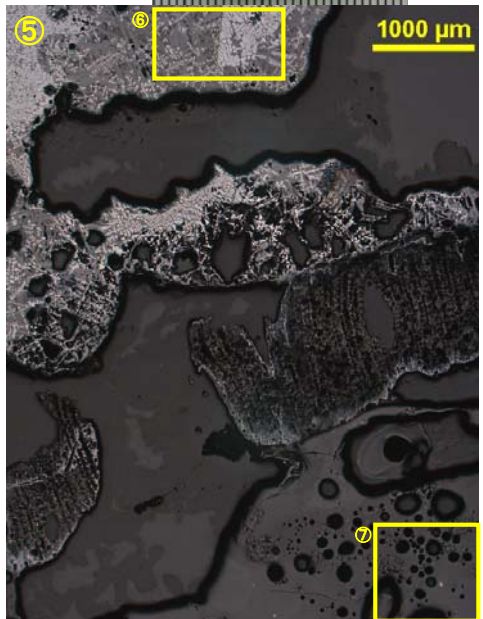
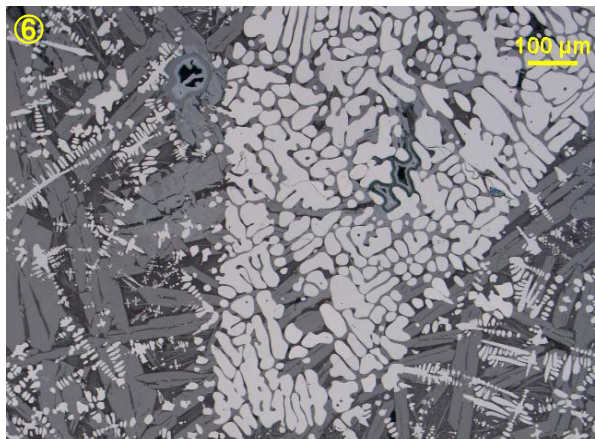
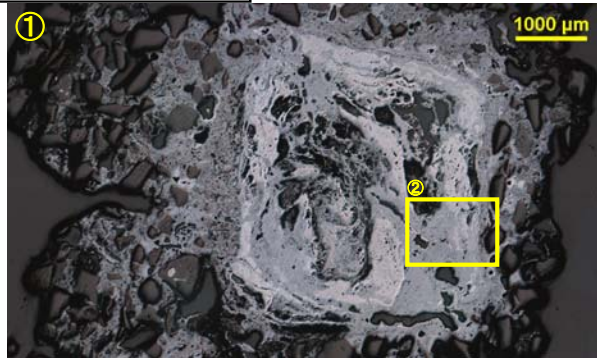
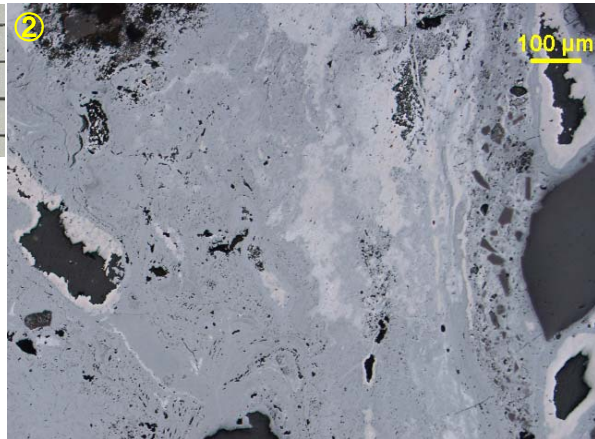


Photo.34 鍛造剥片・椀形鍛冶滓の顕微鏡組織

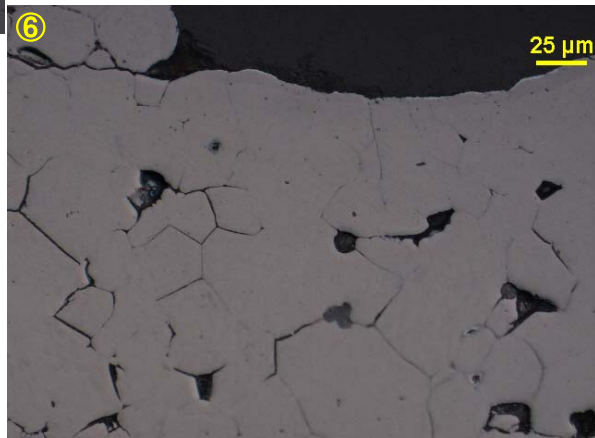
KYS-50
鉄製品(棒状)
①マクロ組織
②錆化鉄部:金属組織痕跡不明瞭



KYS-51-1
鍛造剥片様遺物
③マクロ組織
④錆化鉄部、亜共析組織痕跡



KYS-51-2
鍛造剥片様遺物
⑤マクロ組織
⑥滓部:ウスタイト

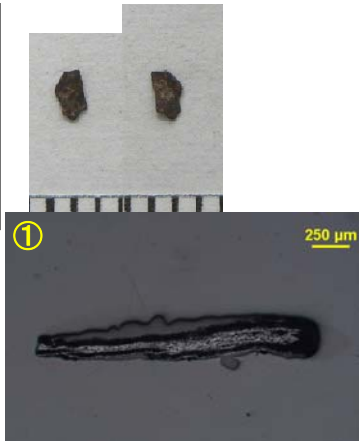


KYS-51-3
鍛造剥片様遺物
⑦マクロ組織
⑧錆化鉄部、亜共析組織痕跡

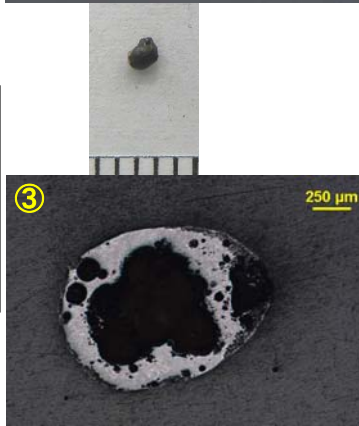


Photo.35 鉄製品・鍛造剥片の顕微鏡組織

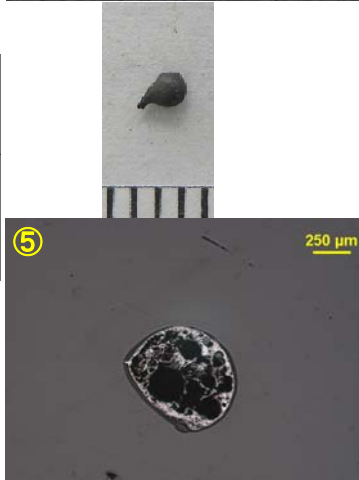
KYS-51-4
 鍛造剥片様遺物
 ①マクロ組織
 ②錆化鉄、金属組織痕跡
 不明瞭



KYS-52-1
 粒状滓
 ③マクロ組織
 ④滓部:ウスタイト



KYS-52-2
 粒状滓
 ⑤マクロ組織
 ⑥滓部:ウスタイト・ファヤライト



KYS-52-3
 粒状滓
 ⑦マクロ組織
 ⑧滓部:ウスタイト

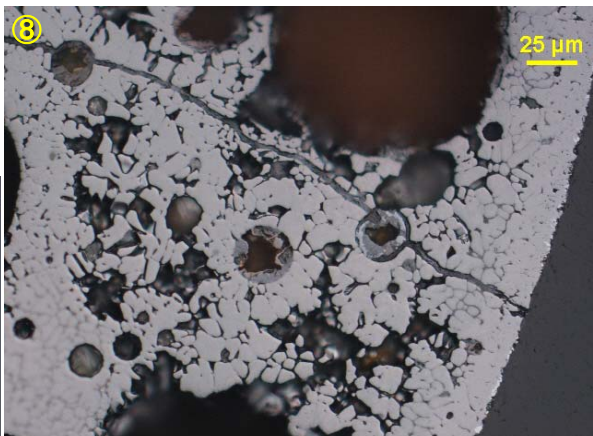
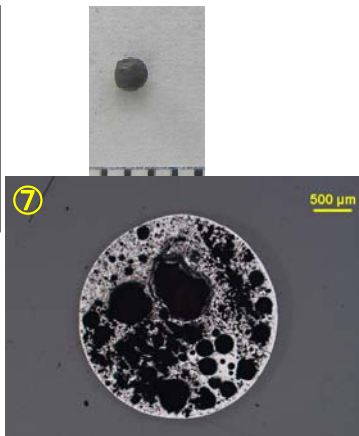
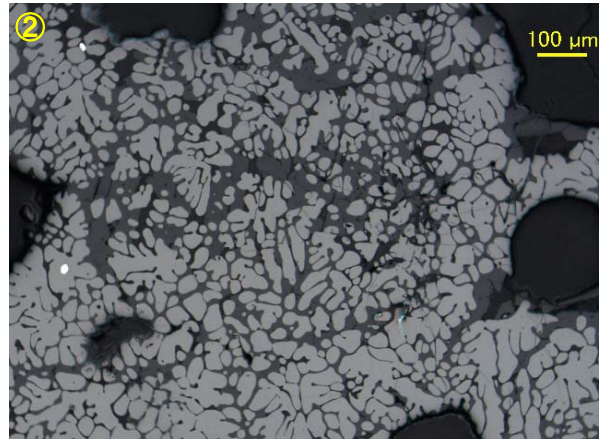
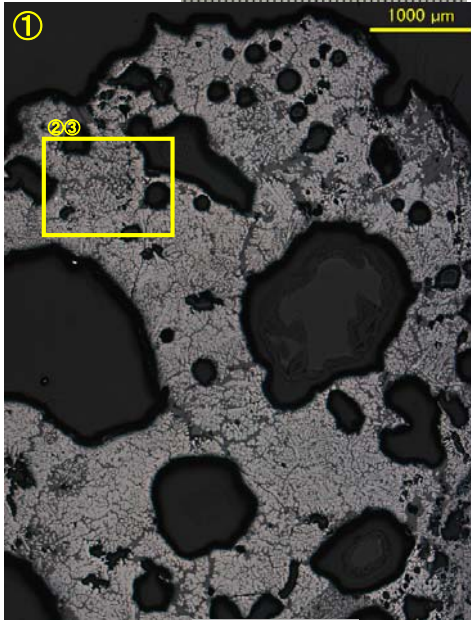


Photo.36 鍛造剥片・粒状滓の顕微鏡組織

KYS-53

椀形鍛冶滓

①～③滓部:ウスタイト・ファイ
ライト、微小明白色粒:金属
鉄



KYS-54

青銅製品

④マクロ組織、
⑤～⑦明色部: α 相 (焼き
なまし双晶)、暗色部: β ´
マルテンサイト、〔高錫青銅:熱

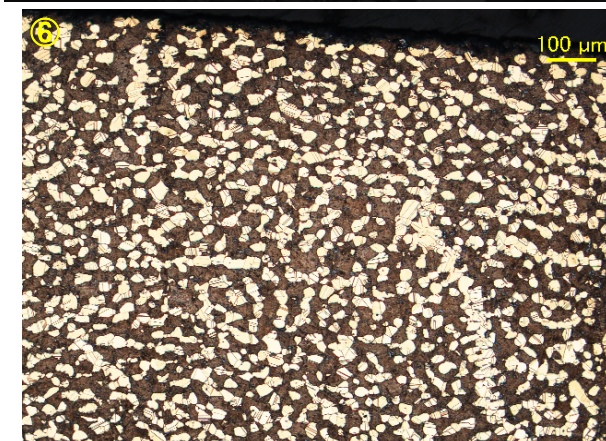
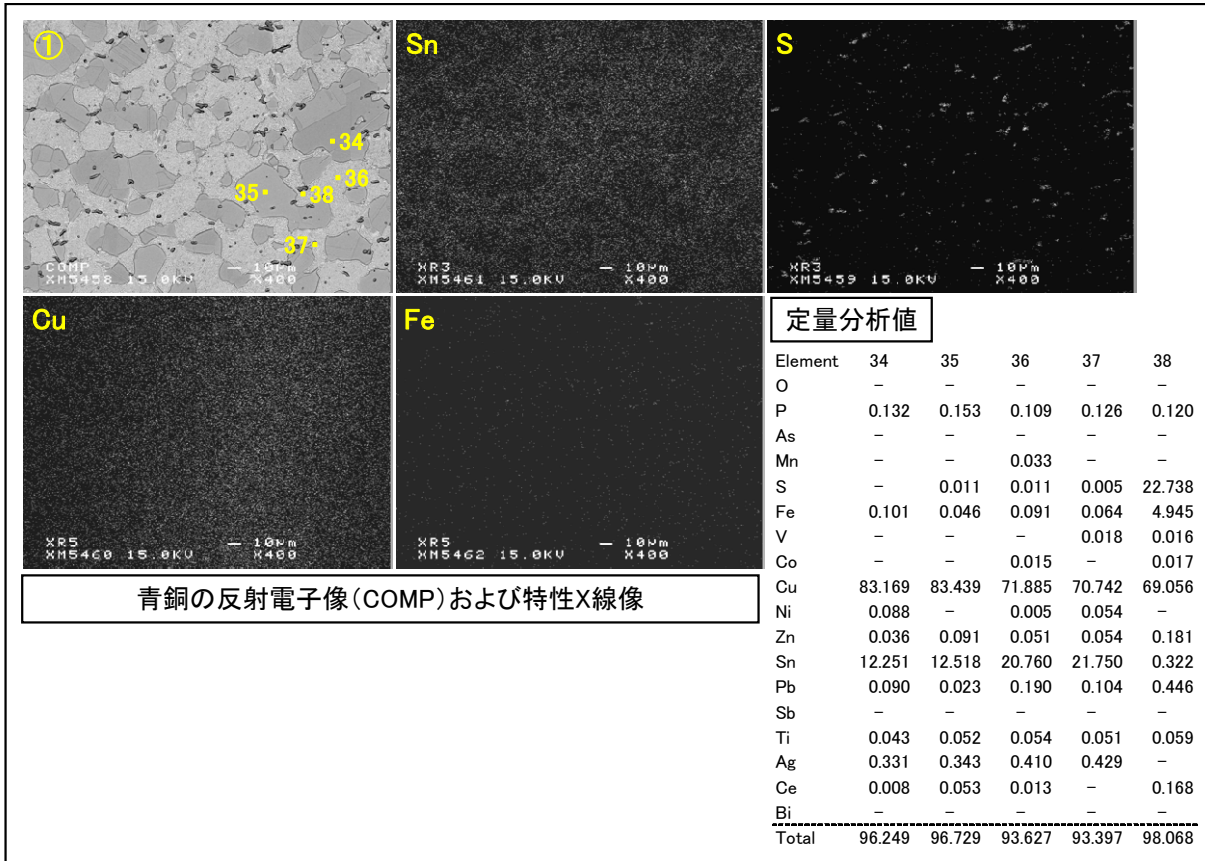


Photo.37 椀形鍛冶滓・青銅製品の顕微鏡組織



KYS-55
ガラス質滓
②～④暗色部:ガラス質滓、
被熱砂鉄散在、灰褐色結
晶:ウスタイトまたはマグネタイト

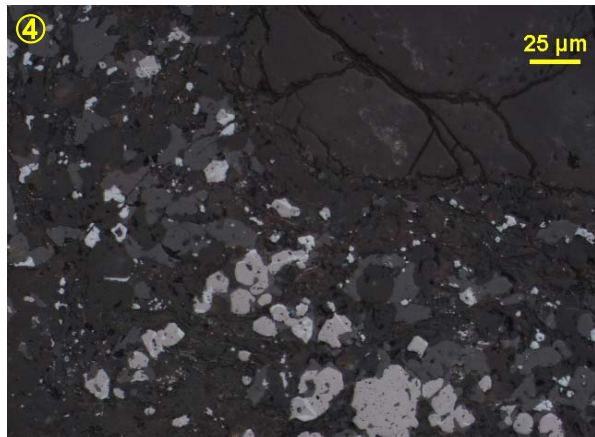
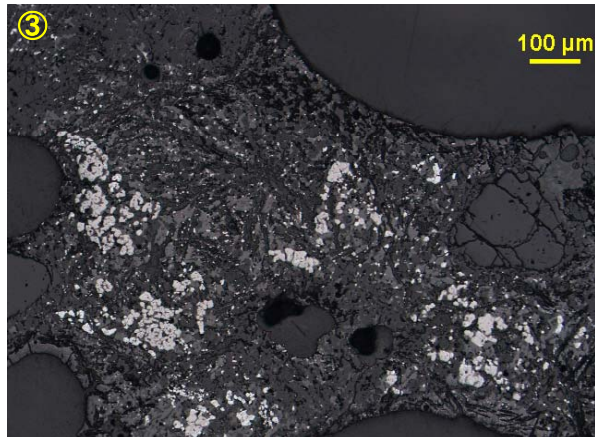
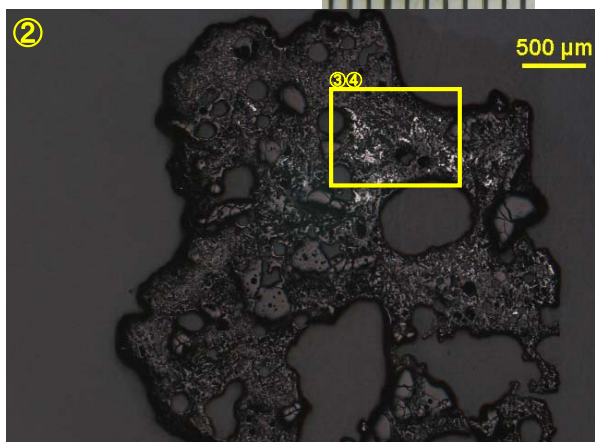


Photo.38 青銅製品のEPMA調査結果・ガラス質滓の顕微鏡組織

KYS-56-1

鉄片

①マクロ組織

②錆化鉄、ねずみ鑄鉄組織痕跡



①

1000 μm



KYS-56-2

鉄片

③マクロ組織

④錆化鉄、ねずみ鑄鉄組織痕跡



③

1000 μm

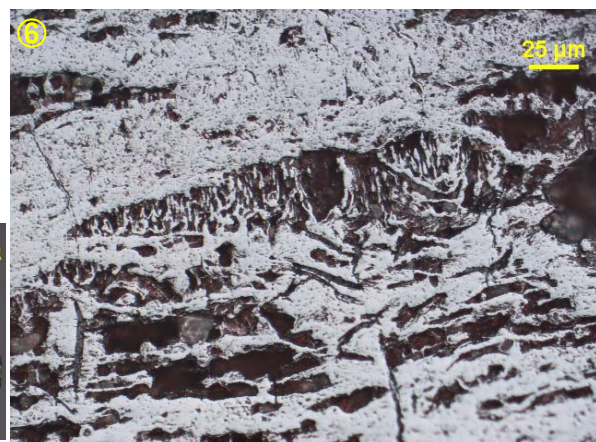


KYS-56-3

鉄片

⑤マクロ組織

⑥錆化鉄、白鑄鉄組織痕跡



⑤

500 μm

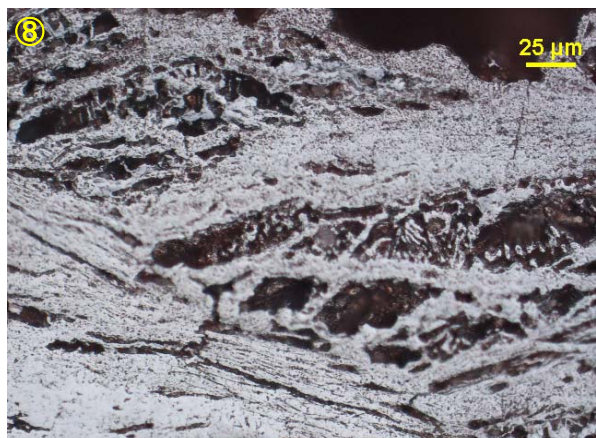


KYS-56-4

鉄片

⑦マクロ組織

⑧錆化鉄、白鑄鉄組織痕跡



⑦

500 μm

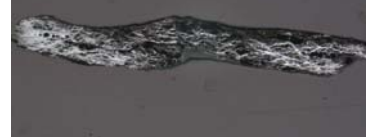
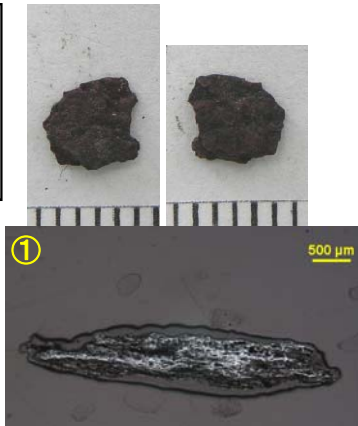
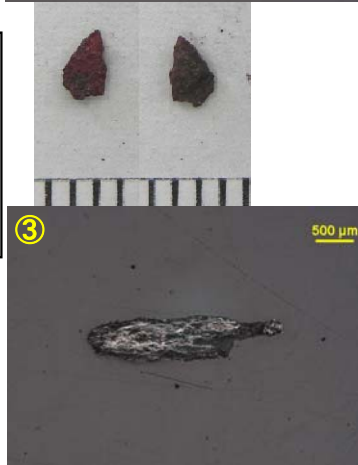


Photo.39 鉄片の顕微鏡組織

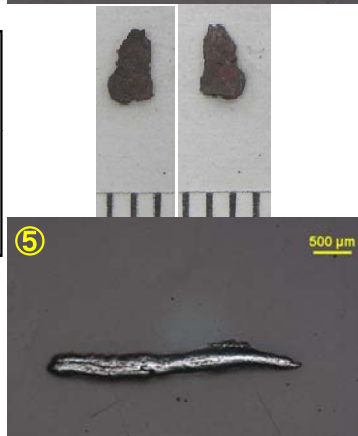
KYS-56-5
鉄片
①マクロ組織
②錆化鉄、ねずみ鑄鉄組織痕跡



KYS-57-1
鉄片
③マクロ組織
④錆化鉄、白鑄鉄組織痕跡



KYS-57-2
鉄片
⑤マクロ組織
⑥錆化鉄、金属組織痕跡不明瞭



KYS-57-3
鉄片
⑦マクロ組織
⑧錆化鉄、金属組織痕跡不明瞭

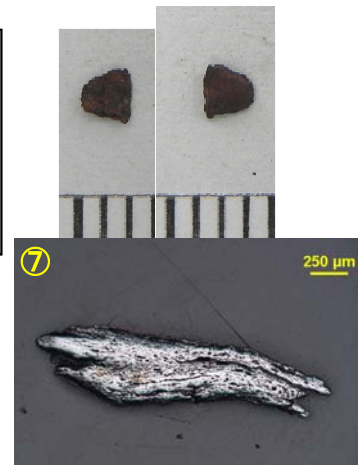
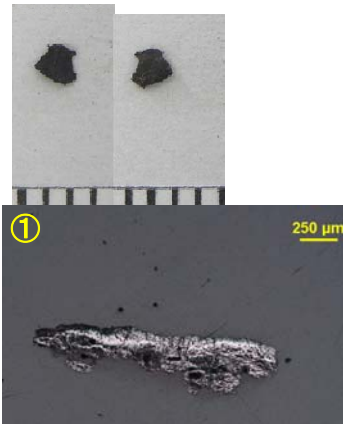
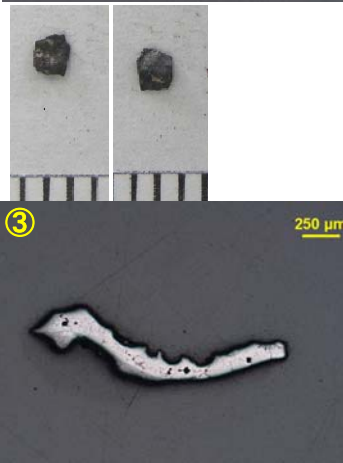


Photo.40 鉄片の顕微鏡組織

KYS-57-4
鉄片
①マクロ組織
②錆化鉄、金属組織痕跡
不明瞭



KYS-57-5
鍛冶滓片
③マクロ組織
④滓部:ウスタイト



KYS-58
ガラス質滓
⑤素地:ガラス質滓、被熱砂粒散在、微小金属鉄・錆化鉄粒散在
⑥⑦錆化鉄部拡大、亜共晶組成白鑄鉄組織痕跡

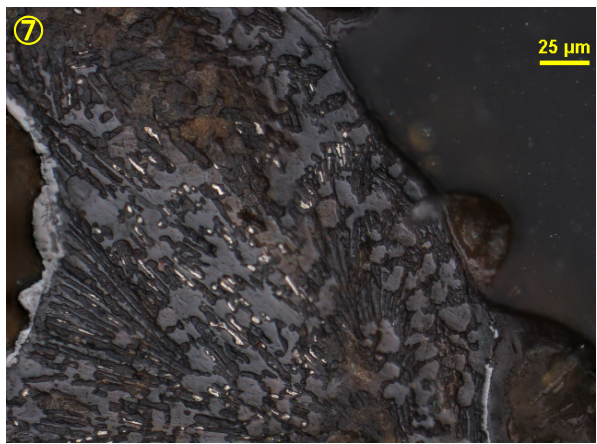
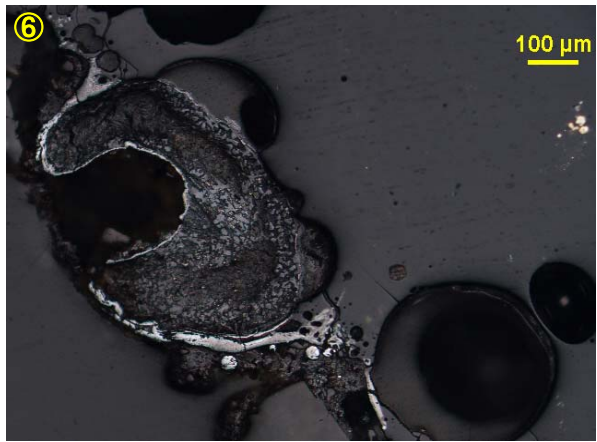
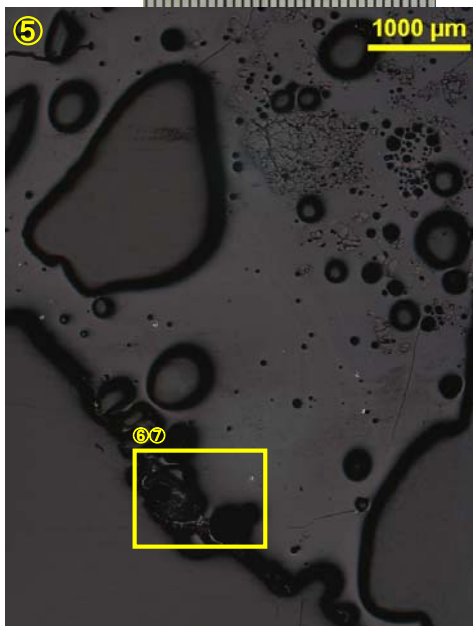
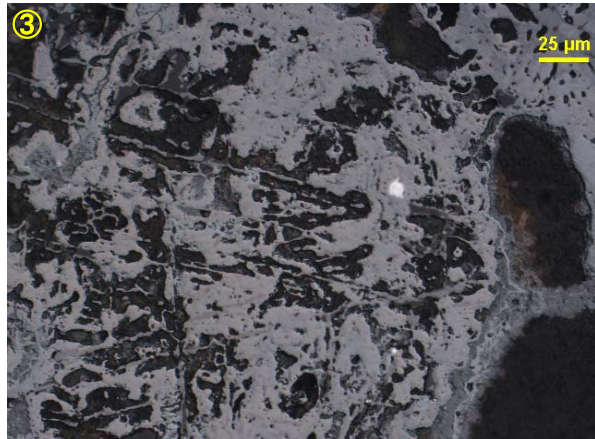
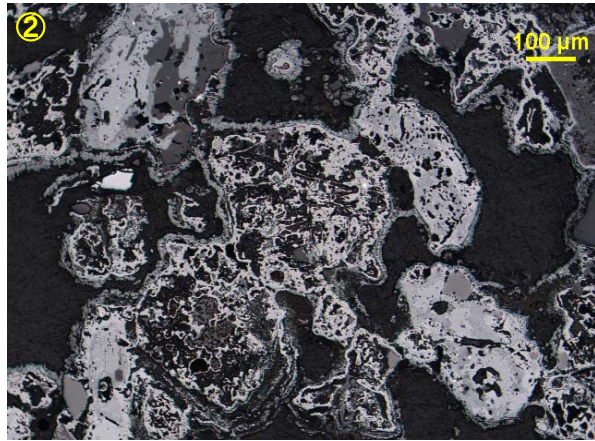
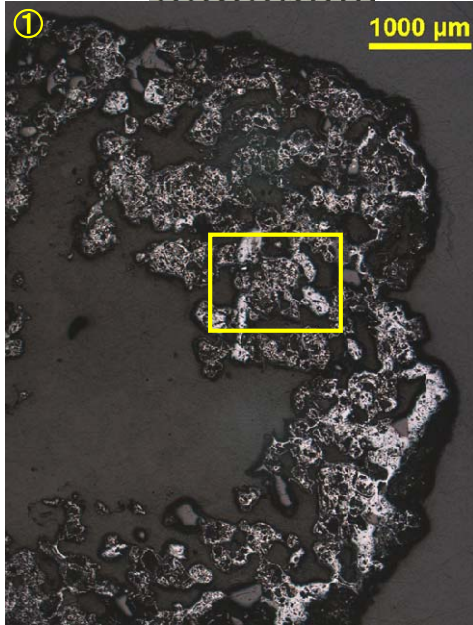


Photo.41 鉄片・鍛冶滓片・ガラス質滓の顕微鏡組織

KYS-59

砂鉄焼結塊？

①～③被熱砂鉄(含タン鉄鉱)分解・滓化進行、微小明白色粒:金属鉄



KYS-60

ガラス質滓

④暗色部ガラス質滓～被熱粘土、滓部:マグネイト

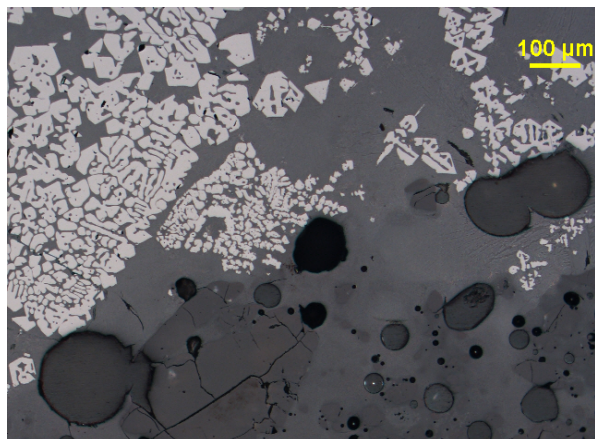
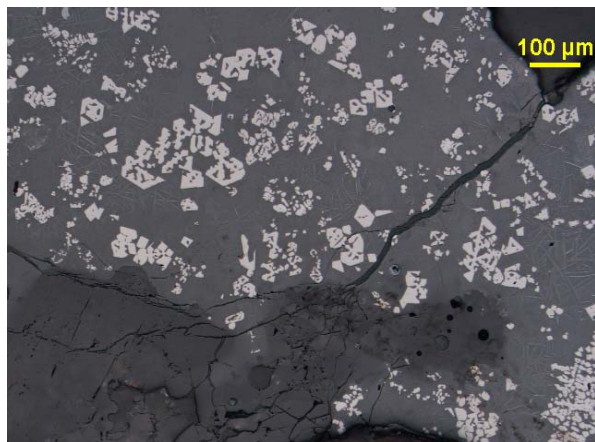
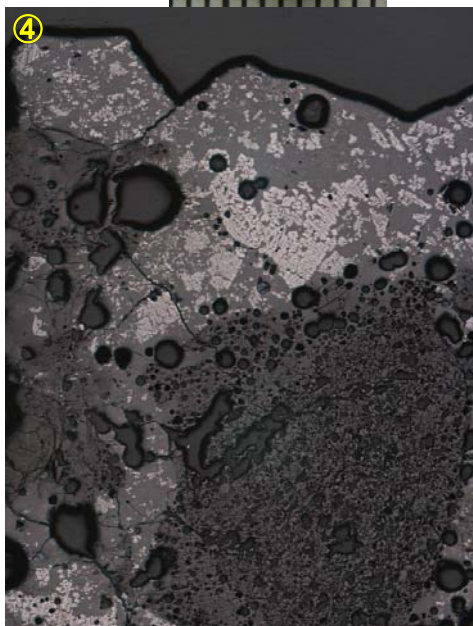
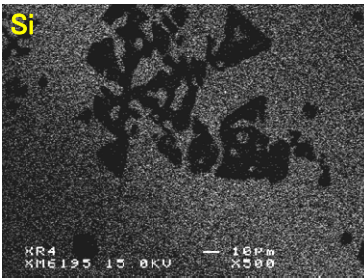
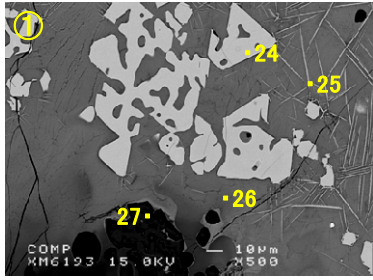
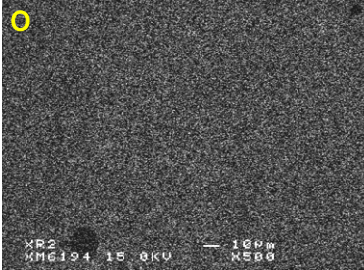
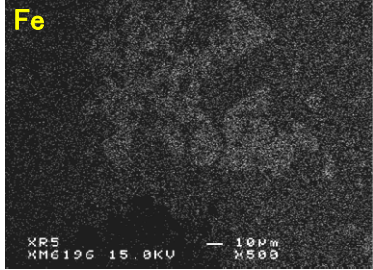


Photo.42 砂鉄焼結塊？・ガラス質滓の顕微鏡組織

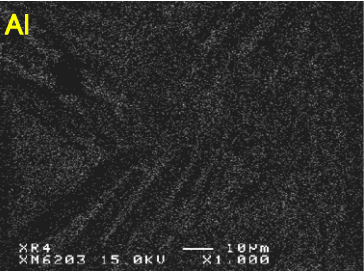
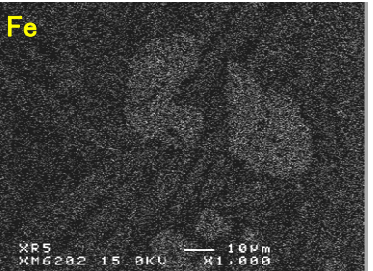
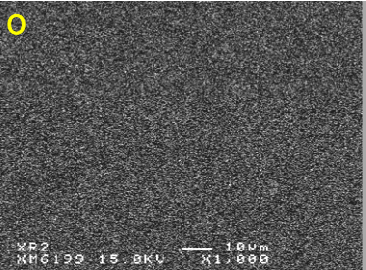
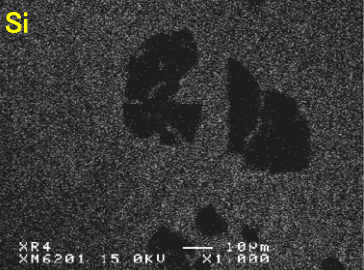
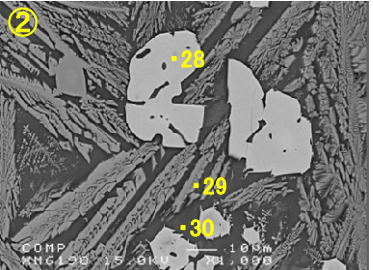


定量分析値

Element	24	25	26	27
F	-	-	-	-
Na ₂ O	0.073	0.787	1.543	0.825
MgO	0.320	0.788	0.956	-
Al ₂ O ₃	4.542	4.533	6.335	26.654
SiO ₂	0.695	26.109	42.947	69.074
P ₂ O ₅	-	0.045	0.276	0.002
S	0.001	0.010	0.007	-
K ₂ O	0.002	1.628	2.152	3.926
CaO	-	0.686	4.361	0.008
TiO ₂	0.502	0.145	0.070	0.154
Cr ₂ O ₃	-	0.010	-	0.006
MnO	0.087	0.064	0.157	0.024
FeO	86.148	59.810	36.945	0.973
SrO	0.029	0.093	0.259	0.306
ZrO ₂	0.006	-	0.026	-
Element	92.405	94.708	96.034	101.952

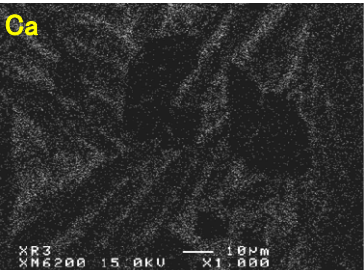


滓部の反射電子像 (COMP) および特性X線像



定量分析値

Element	28	29	30
F	-	-	0.175
Na ₂ O	-	0.201	1.988
MgO	0.437	2.107	0.252
Al ₂ O ₃	6.161	0.125	8.574
SiO ₂	0.776	31.048	49.280
P ₂ O ₅	-	0.063	0.699
S	0.006	0.010	0.078
K ₂ O	-	0.036	2.803
CaO	-	0.728	11.168
TiO ₂	0.829	0.085	0.165
Cr ₂ O ₃	0.023	0.035	0.064
MnO	0.110	0.334	0.108
FeO	75.450	59.421	22.433
SrO	0.020	0.084	0.333
ZrO ₂	-	-	-
Element	83.813	94.277	98.046



滓部の反射電子像 (COMP) および特性X線像

Photo.43 ガラス質滓の顕微鏡組織