ESTUDO DE CASOS UTILIZANDO MEV + EDS/WDS

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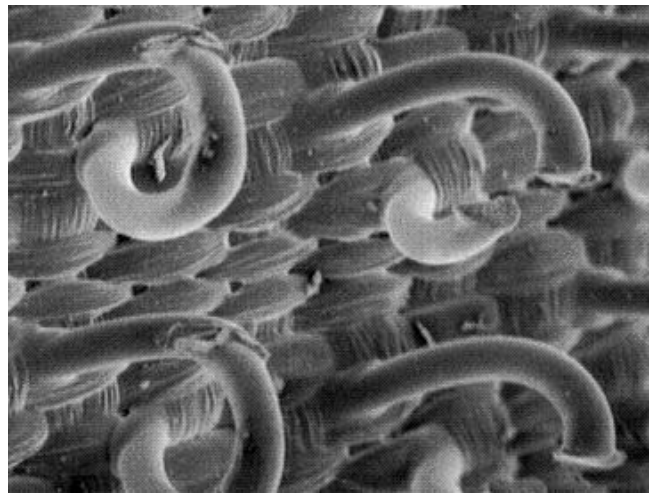
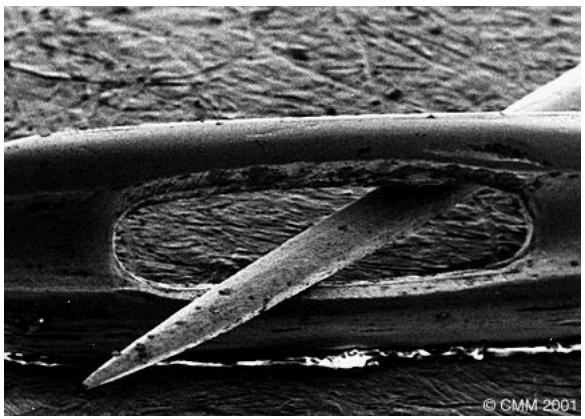
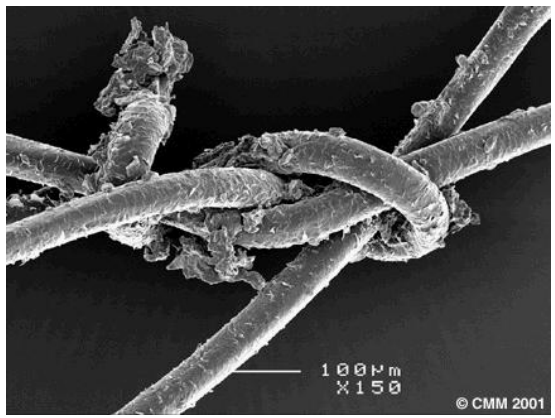
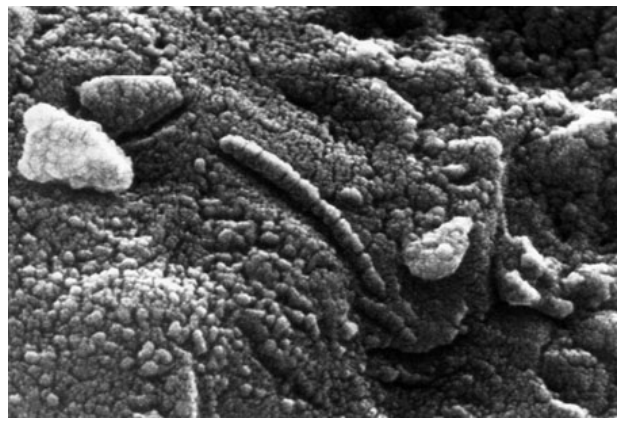
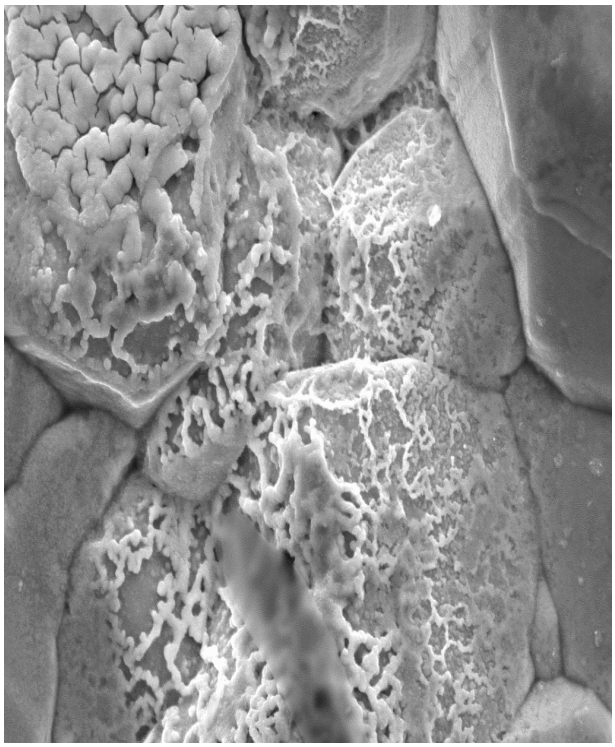
Imagens MEV

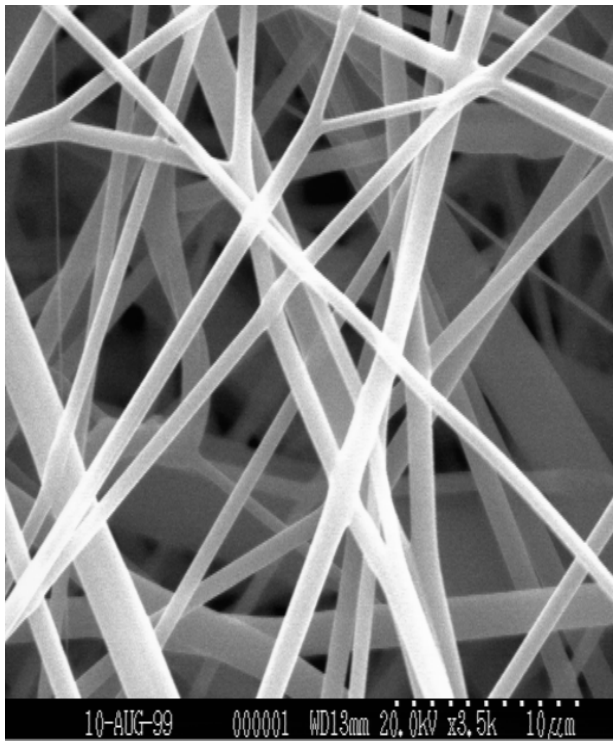








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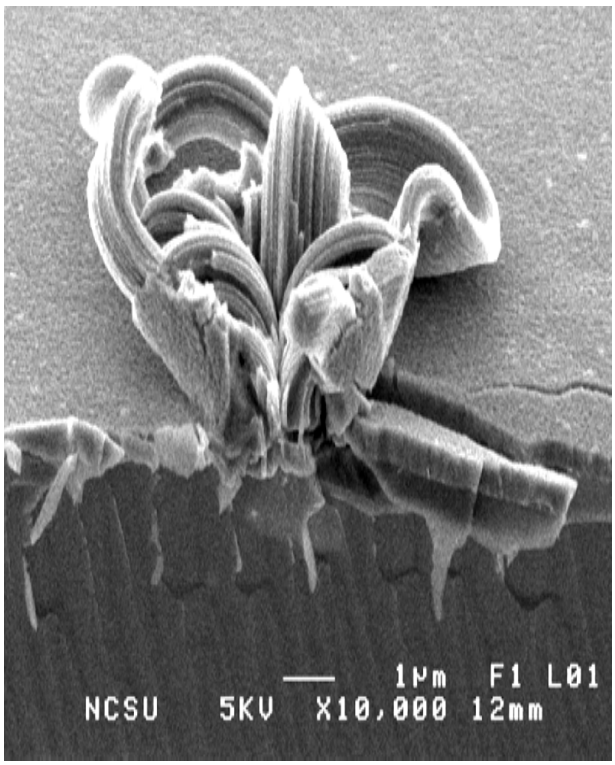
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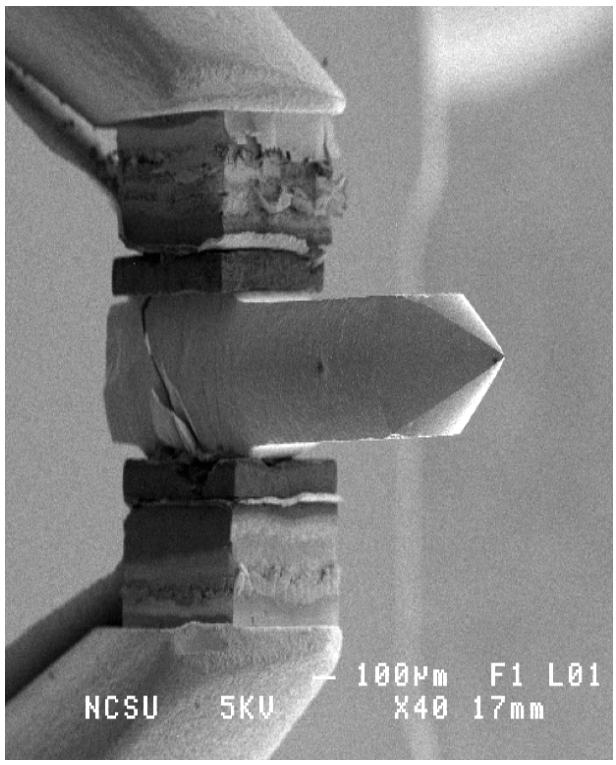
100µm F1 L01
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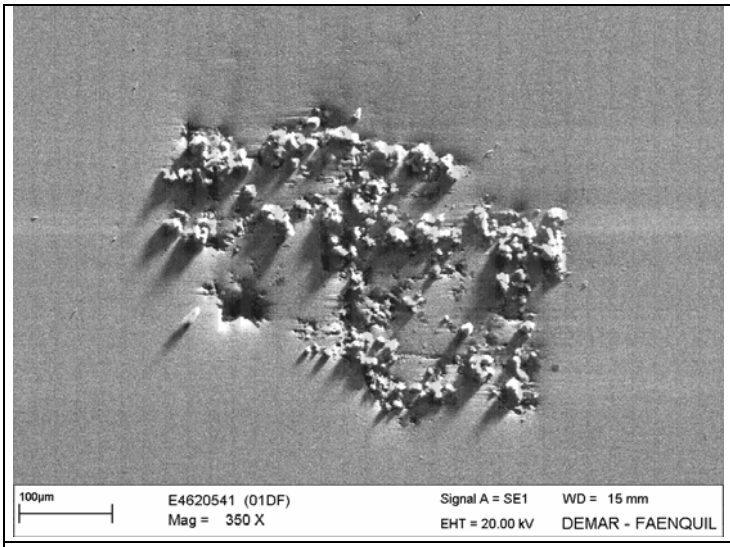
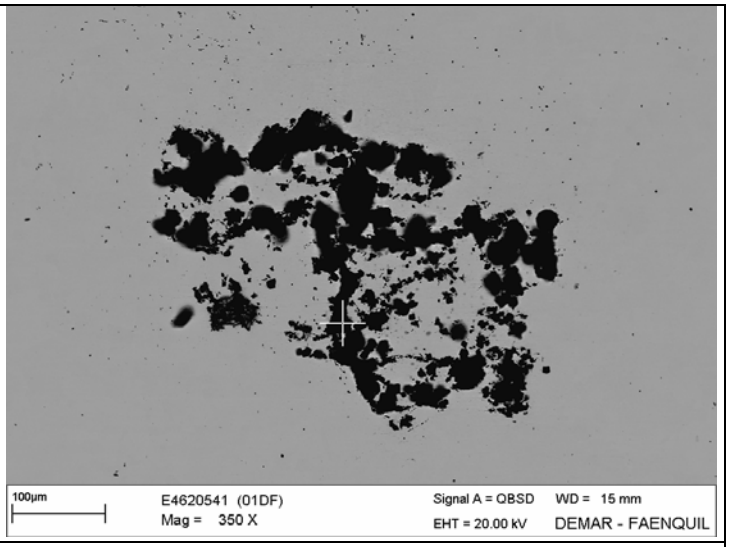
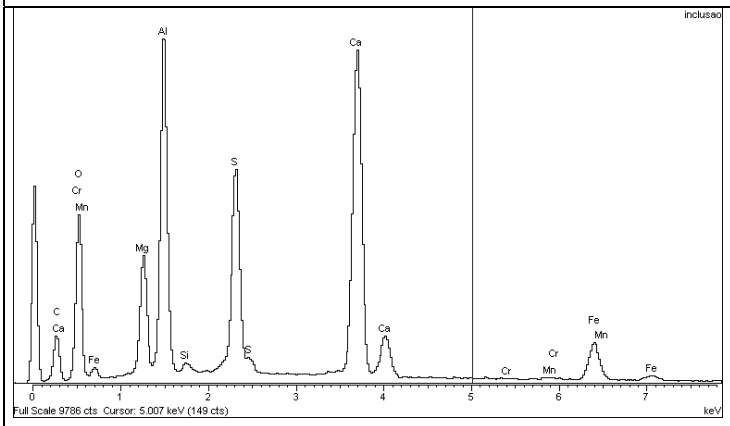




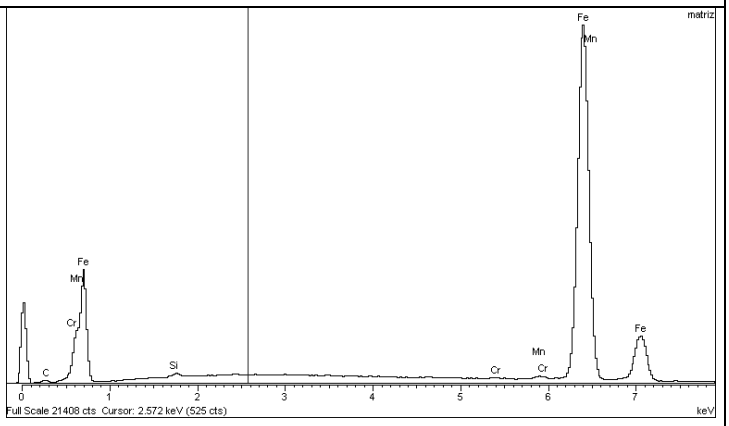


Spectrum processing :
No peaks omitted

Processing option : All elements analyzed (Normalised)
Number of iterations = 4

Standard :
C CaCO3 1-Jun-1999 12:00 AM
O SiO2 1-Jun-1999 12:00 AM
Mg MgO 1-Jun-1999 12:00 AM
Al Al2O3 1-Jun-1999 12:00 AM
Si SiO2 1-Jun-1999 12:00 AM
S FeS2 1-Jun-1999 12:00 AM
Ca Wollastonite 1-Jun-1999 12:00 AM
Cr Cr 1-Jun-1999 12:00 AM
Mn Mn 1-Jun-1999 12:00 AM
Fe Fe 1-Jun-1999 12:00 AM

Element	Weight%	Atomic%
C K	16.91	27.41
O K	38.03	46.28
Mg K	4.58	3.67
Al K	11.59	8.36
Si K	0.33	0.23
S K	7.40	4.49
Ca K	15.92	7.73
Cr K	0.08	0.03
Mn K	0.14	0.05
Fe K	5.02	1.75
Totals	100.00	



Spectrum processing :
Peak possibly omitted : 12.811 keV

Processing option : All elements analyzed (Normalised)
Number of iterations = 3

Standard :
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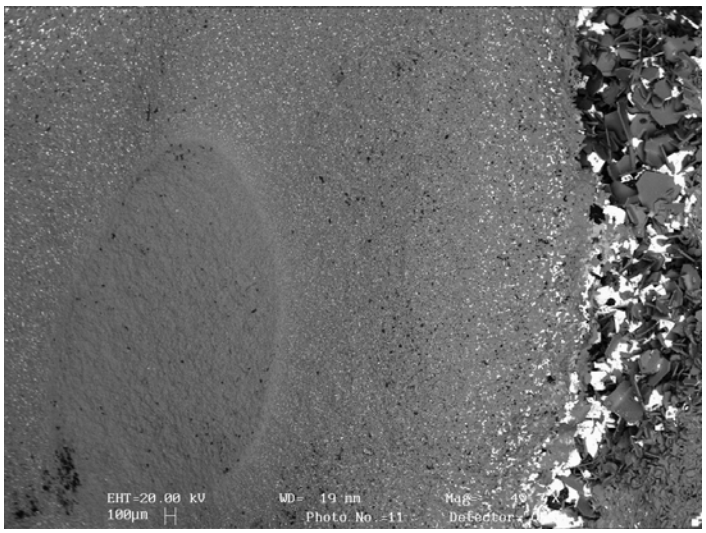
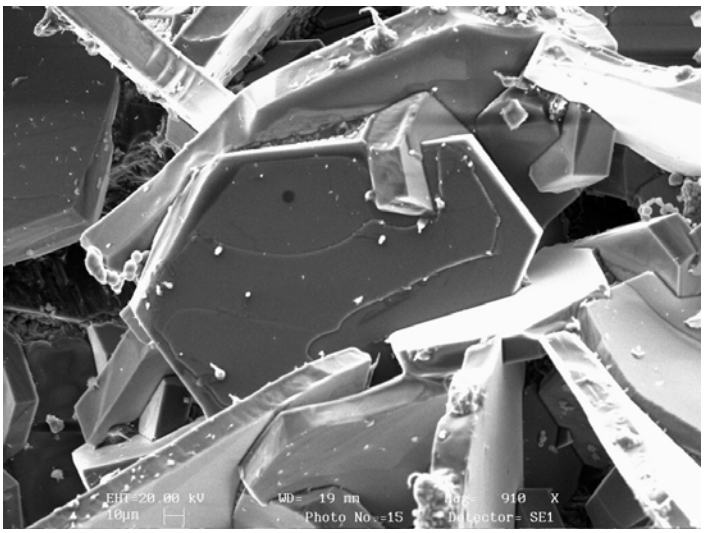
Si SiO2 1-Jun-1999 12:00 AM
Cr Cr 1-Jun-1999 12:00 AM
Mn Mn 1-Jun-1999 12:00 AM
Fe Fe 1-Jun-1999 12:00 AM

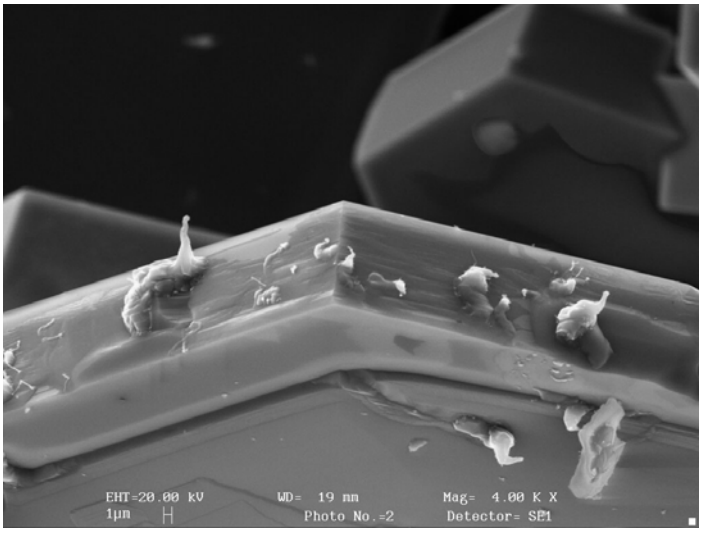
Element	Weight%	Atomic%
C K	1.69	7.39
Si K	0.31	0.58
Cr K	0.13	0.13
Mn K	0.55	0.52
Fe K	97.32	91.38
Totals	100.00	

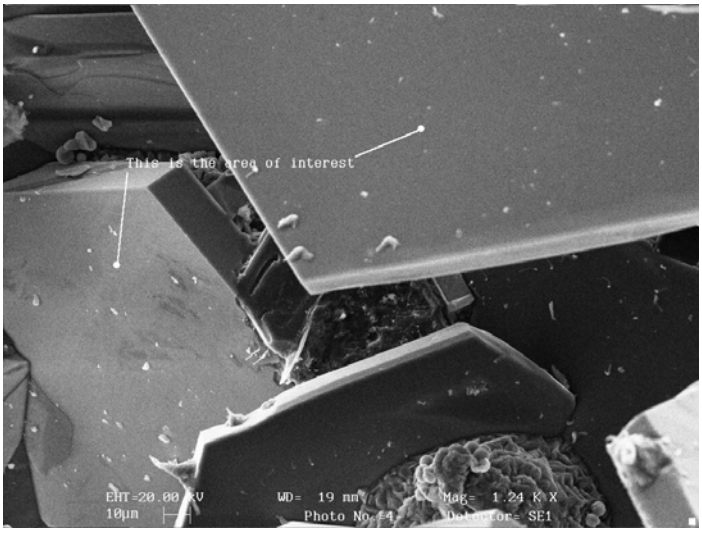
MICROGRAFIAS DE SiC

(fotos obtidas no MEV - LEO 345VPi)



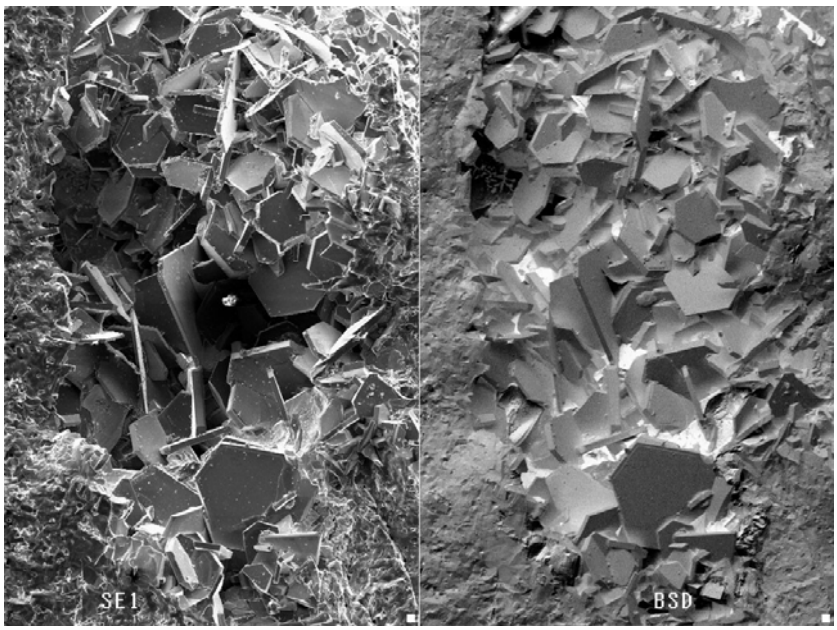


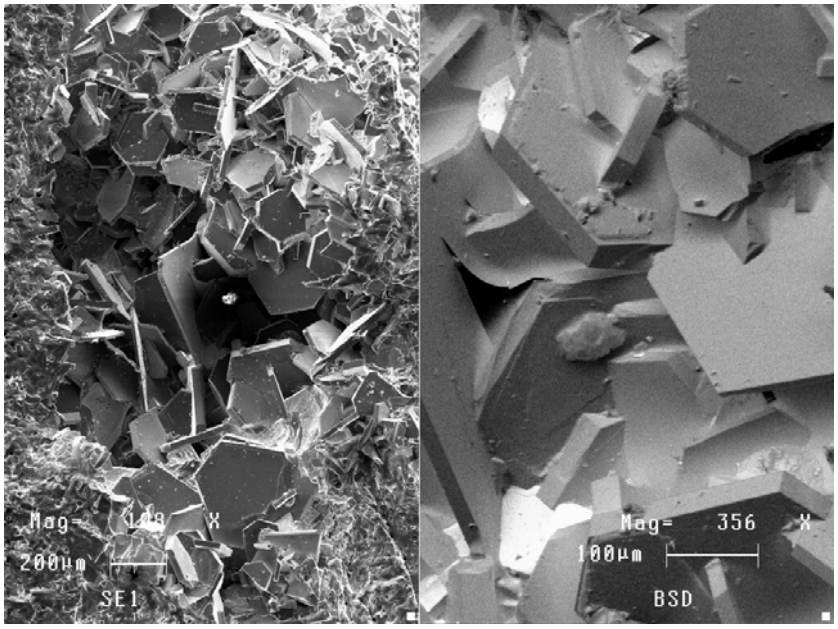


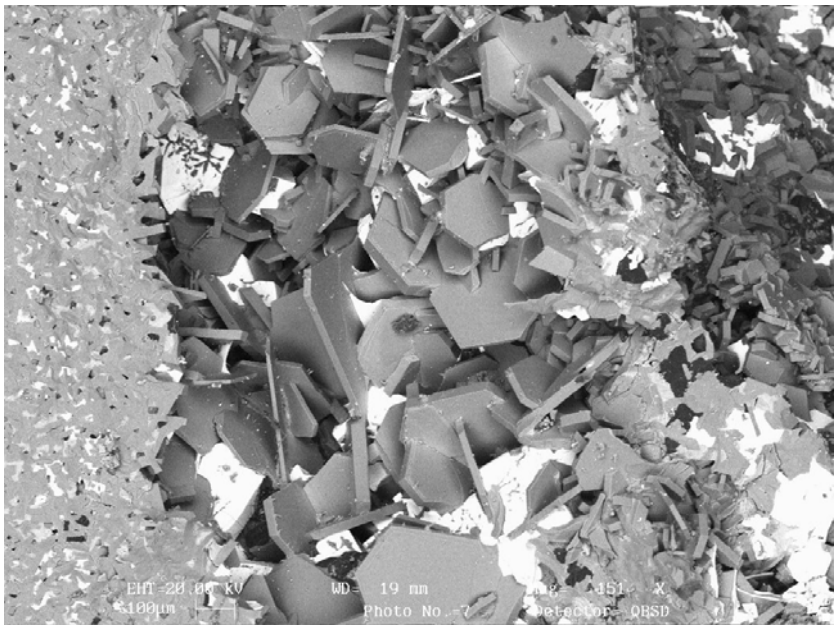


MICROGRAFIAS DE SiC

(fotos obtidas no MEV - LEO 345VPi)

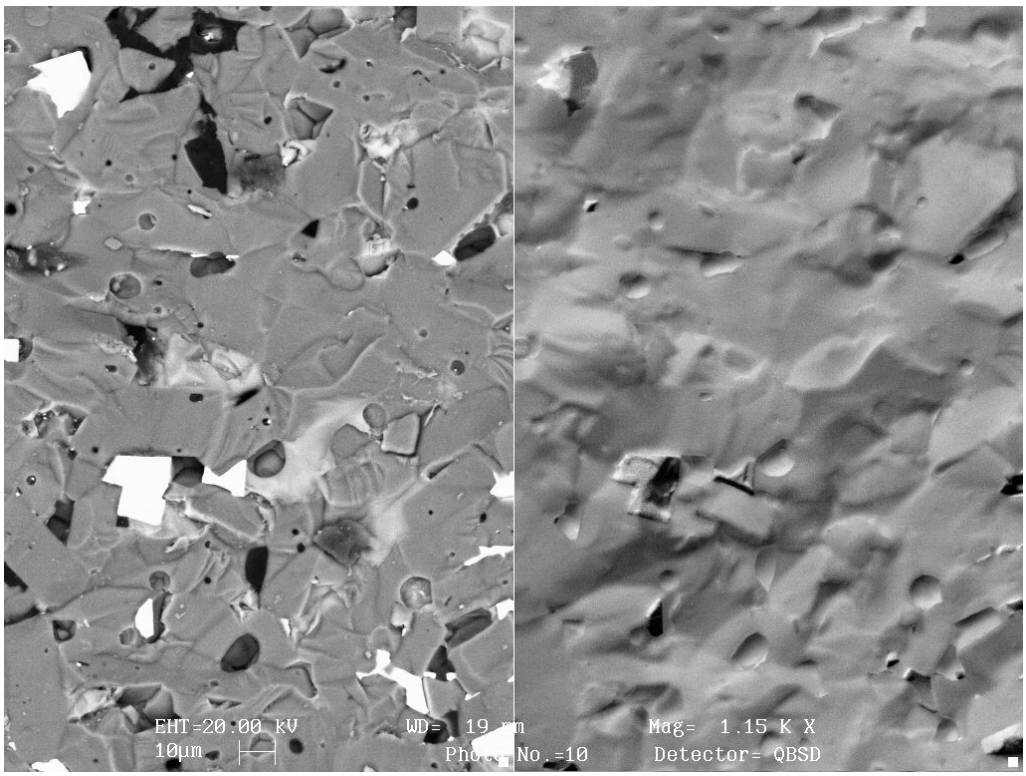


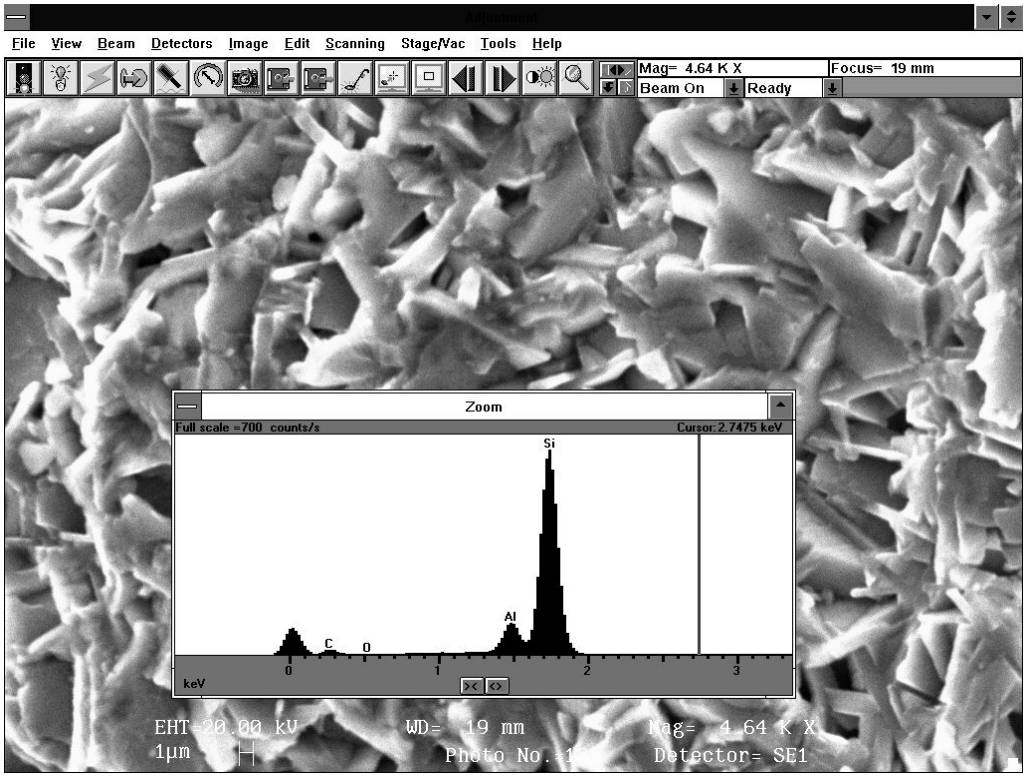




MICROGRAFIAS DE SiC

(fotos obtidas no MEV - LEO 345VPi)

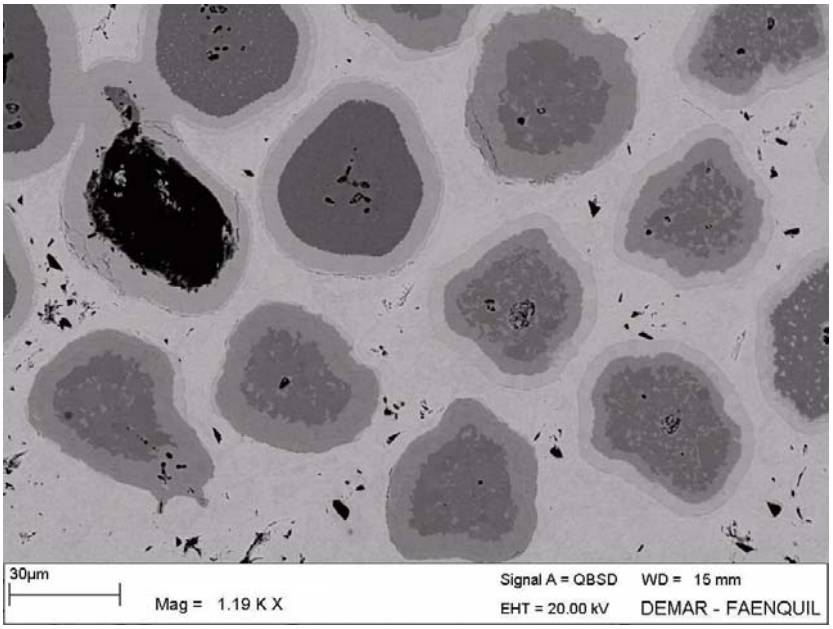




TRATAMENTOS TÉRMICOS, DIFUSÃO E FORMAÇÃO DE FASES EM SUPERCONDUTORES MULTIFILAMENTARES DE Cu+Nb_3Al

F. M. Negreiros, C. A. Rodrigues, D. Rodrigues Jr., CBECIMAT 2002, Natal, RN

(a)



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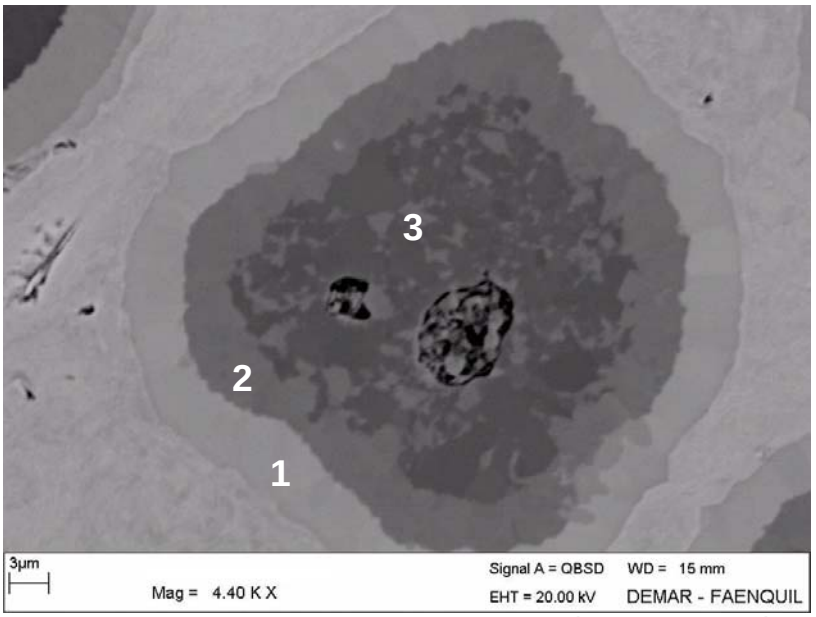


Figura 2. Micrografia obtida em MEV do primeiro embutimento após tratamento térmico a 800^{0}C durante 200 horas: (a) região de filamentos, (b) identificação de fases relativas à Tabela I.

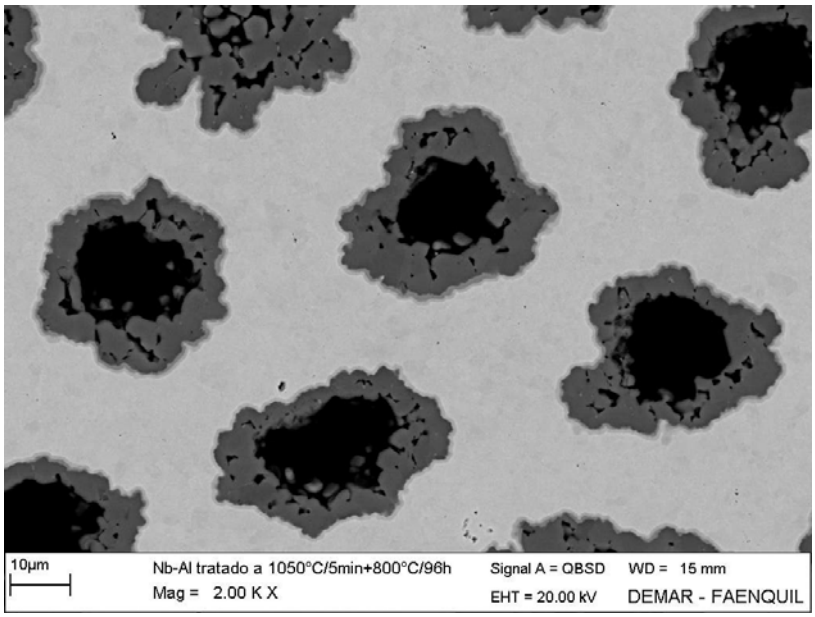
Tabela I. Resultados das medidas de composição por EDS das diferentes fases presentes no primeiro embutimento tratado a 800^{0}C por 200 horas (Figura 2).

Posição	Composição (%at)	Identificação das fases
1	Nb 82,4 Al 17,6 Cu 1,0	Nb_3Al
2	Nb 47,8 Al 26,9 Cu 25,3	Fase intermediária de Nb_3Al + Nb_2Al
3	Nb 62,1 Al 35,3 Cu 2,6	Nb_2Al

TRATAMENTOS TÉRMICOS, DIFUSÃO E FORMAÇÃO DE FASES EM SUPERCONDUTORES MULTIFILAMENTARES DE Cu+Nb_3Al

F. M. Negreiros, C. A. Rodrigues, D. Rodrigues Jr., CBECIMAT 2002, Natal, RN

(a)



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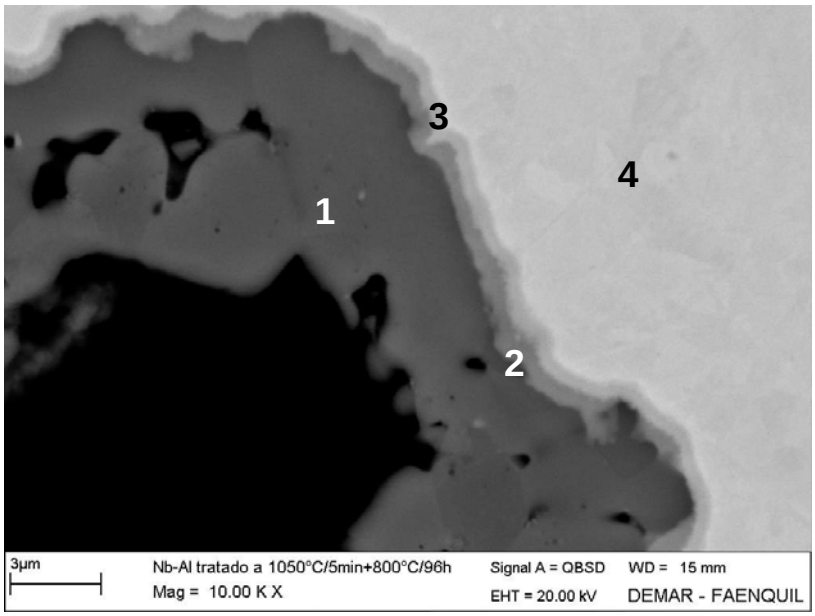


Figura 3. Micrografia obtida em MEV do primeiro embutimento após tratamento térmico a 1050^{0}C/5min + 800^{0}C/96horas: (a) região de filamentos, (b) identificação de fases relativas à Tabela II.

Tabela II. Resultados das medidas de composição por EDS das diferentes fases presentes no primeiro embutimento tratado a 1050^{0}C/5min + 800^{0}C/96h (Figura 3).

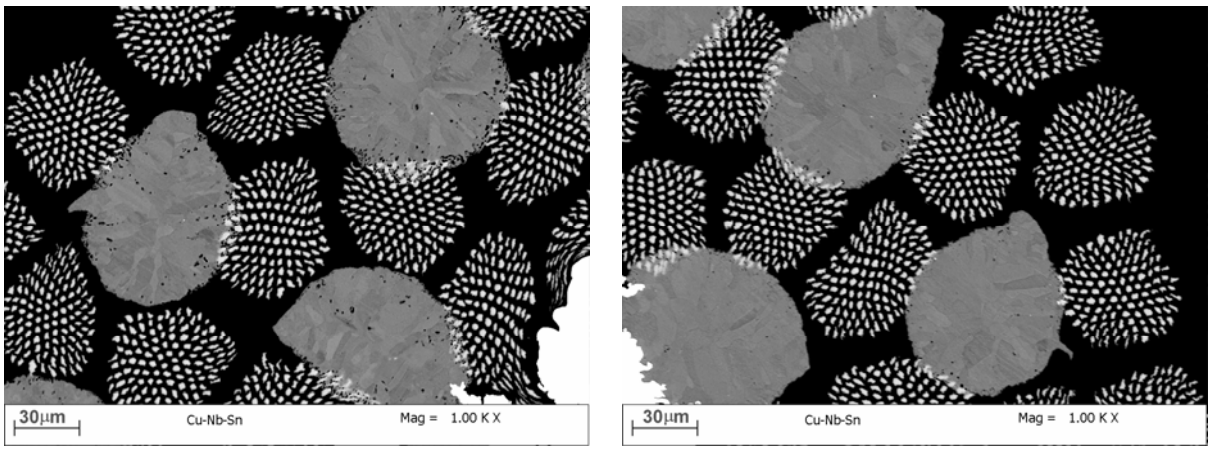
Posição	Composição (%at)	Identificação das fases
1	Nb 26,0 Al 72,9 Cu 1,1	$NbAl_3$
2	Nb 40,6 Al 52,6 Cu 6,8	Fase intermediária de $NbAl_3$+Nb_2Al
3	Nb 67,7 Al 30,9 Cu 1,3	Nb_2Al (provável) (Existe diferença na composição devido à pequena dimensão da fase)
4	Nb 100	Nb puro

Development, Heat Treatment Optimization and Microstructural Characterization of Nb_3Sn Superconductor Wire

C. A. Rodrigues, J. P. B. Machado, D. Rodrigues Jr.; IEEE Trans. Applied Superconductivity, June 2003.

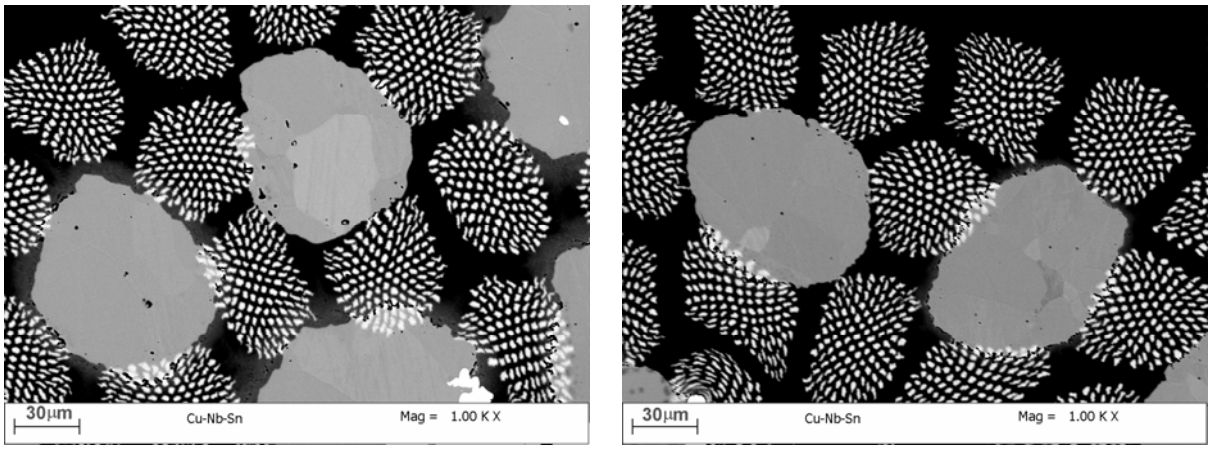
TABLE I - HEAT TREATMENT PROFILES

	1º Step	2º Step	3º Step	4º Step	5º Step
	Temp./Time	Temp./Time	Temp./Time	Temp./Time	Temp./Time
Sample 1		360°C/50h			
Sample 2			480°C/50h		
Sample 3				575°C/50h	
Sample 4				575°C/100h	
Sample 5	220°C/100h	360°C/50h			
Sample 6	220°C/100h	360°C/50h	480°C/50h		
Sample 7	220°C/100h	360°C/50h	480°C/50h	575°C/50h	
Sample 8		360°C/100h			700°C/100h
Sample 9			480°C/50h		700°C/100h
Sample 10				575°C/50h	700°C/100h
Sample 11				575°C/100h	700°C/100h
Sample 12	220°C/100h	360°C/50h	480°C/50h		700°C/100h
Sample 13	220°C/100h	360°C/50h	480°C/50h		700°C/150h
Sample 14	220°C/100h	360°C/50h	480°C/50h		700°C/150h



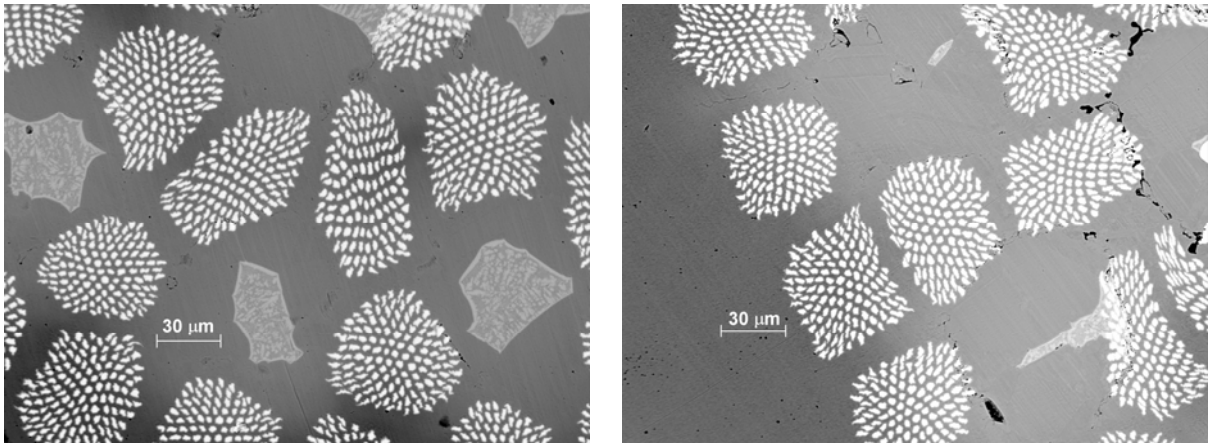
(a) (b)

Fig. 1. Microstructures formed after heat treatments for: (a) Sample 1; (b) Sample 5. **Formation of ε phase.**



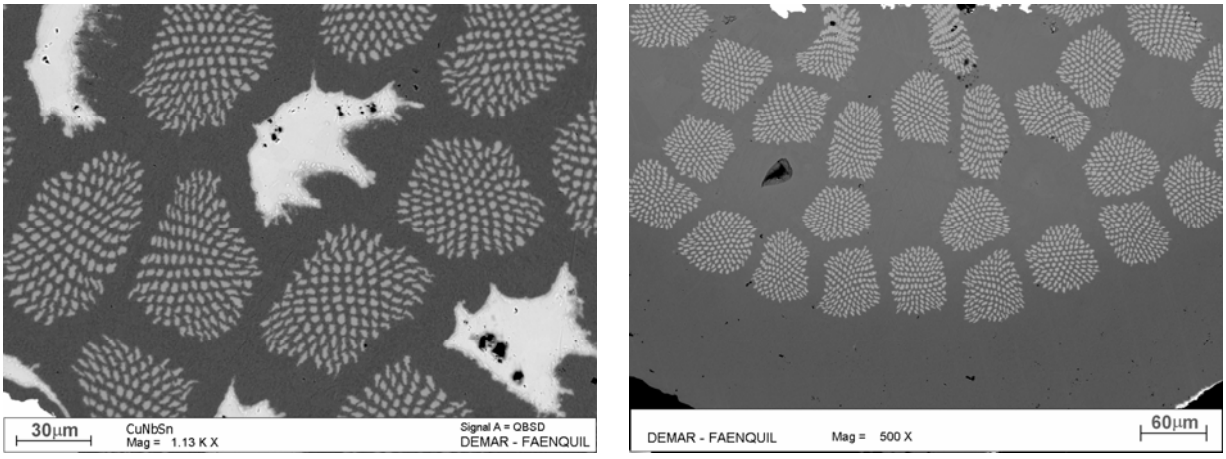
(a) (b)

Fig. 2. Microstructures formed after heat treatments for: (a) Sample 2; (b) Sample 6. **Formation of δ phase.**



(a) (b)

Fig. 3. Microstructures formed after heat treatments for: (a) Sample 3; (b) Sample 7**. Eutectoid decomposition of γ phase.**



(a) (b)

Fig. 4. Microstructures of sample 4 before (a) and after (b) heat treatment, showing the complete conversion of the Sn cores into α phase.

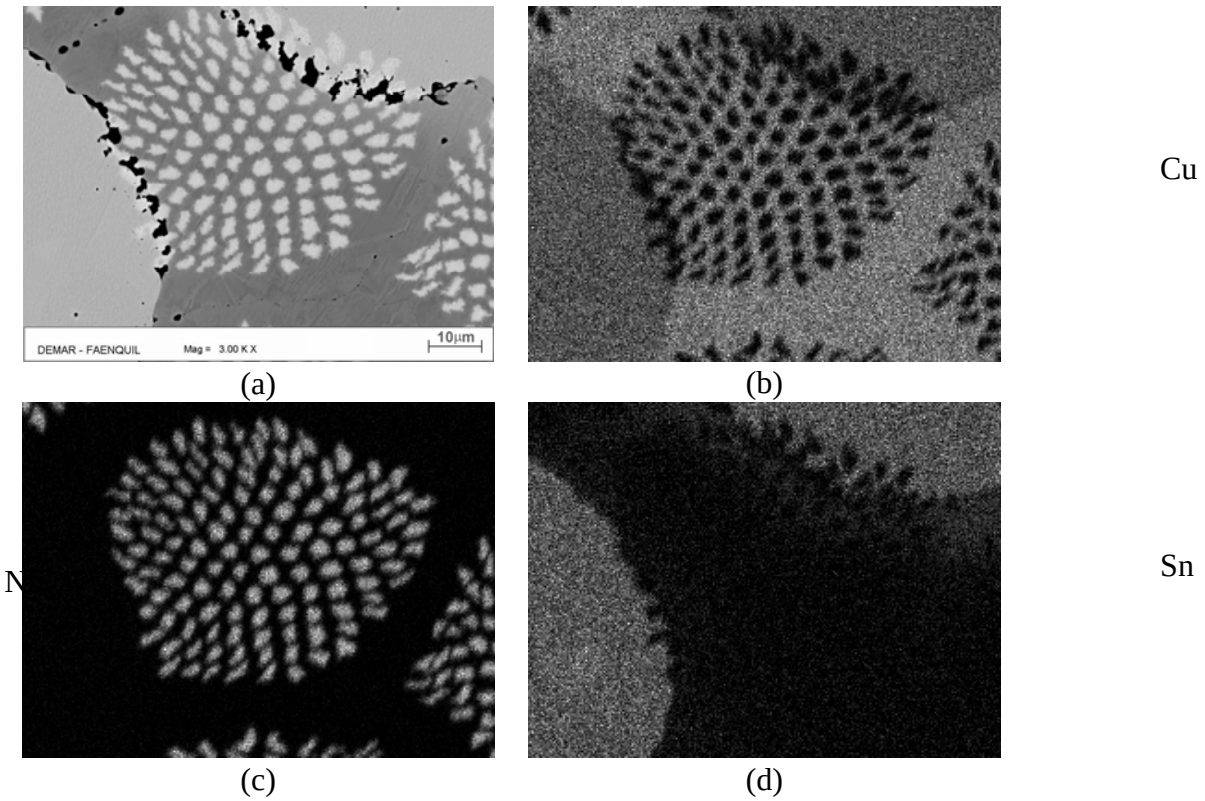


Fig. 5. Microstructure and X-ray mapping found using SEM+EDS for sample 2. (a) SEM image using backscattered electrons; (b) mapping of Cu; (c) mapping of Nb; (d) mapping of Sn.

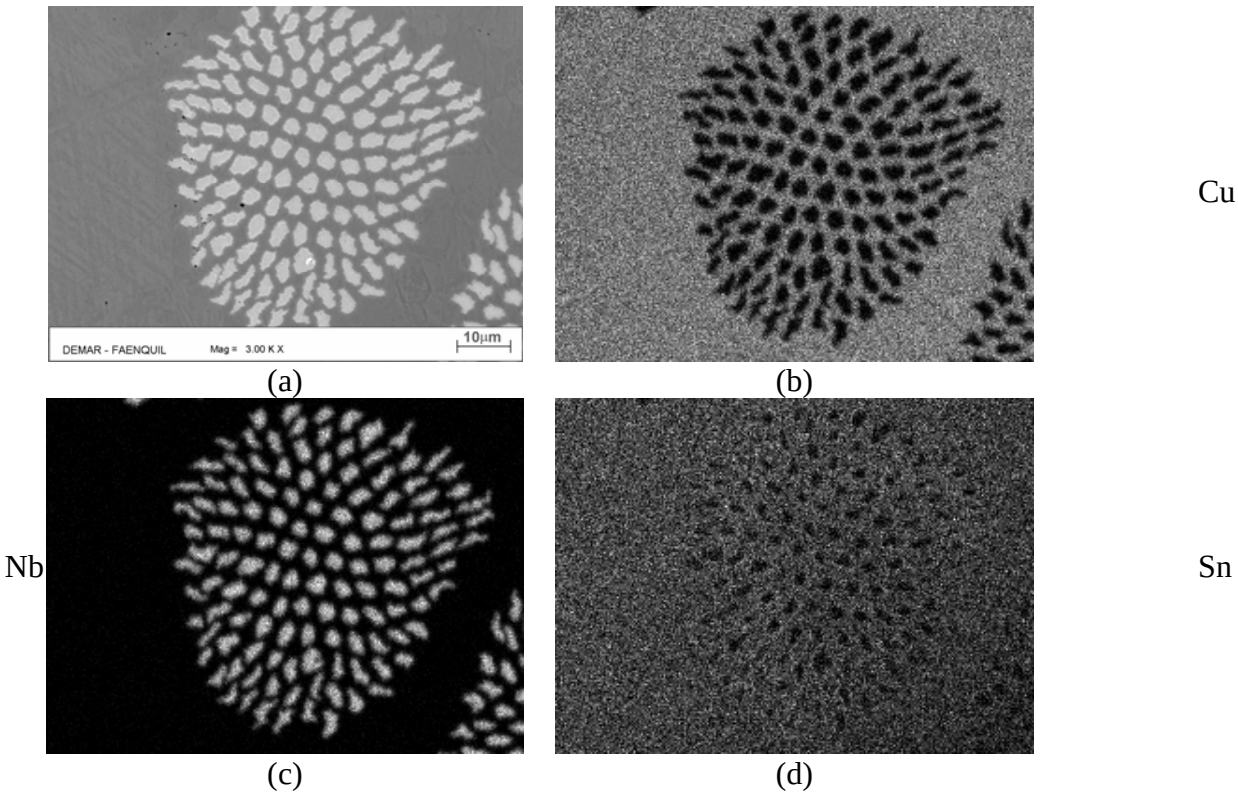


Fig. 6. Microstructure and X-ray mapping found using SEM+EDS for sample 4. (a) SEM image using backscattered electrons; (b) mapping of Cu; (c) mapping of Nb; (d) mapping of Sn. It can be noted the better homogenization of Sn compared to sample 2 (Fig. 5).

MICROSCOPIC FEATURES RELATED TO FATIGUE CRACK GROWTH IN COMMERCIAL-PURITY TITANIUM

Luciana S. Rossino, Carlos A. R. P. Baptista, D. Rodrigues Jr., Fatigue 2002, Stockholm.

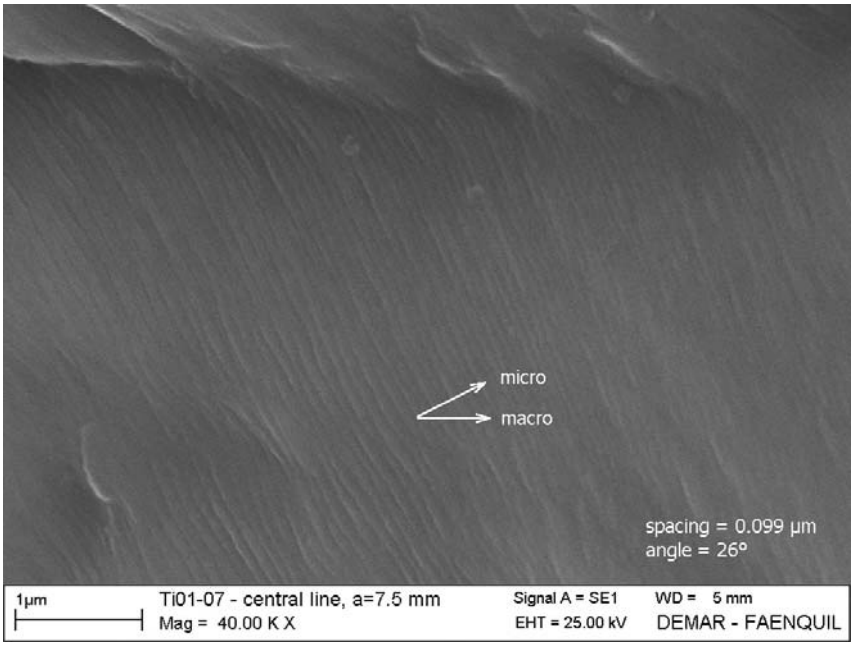


FIGURE 1 Representative SEM fractography of type A striation pattern (sample tested with R = 0.5 and *a* = 7.5 mm).

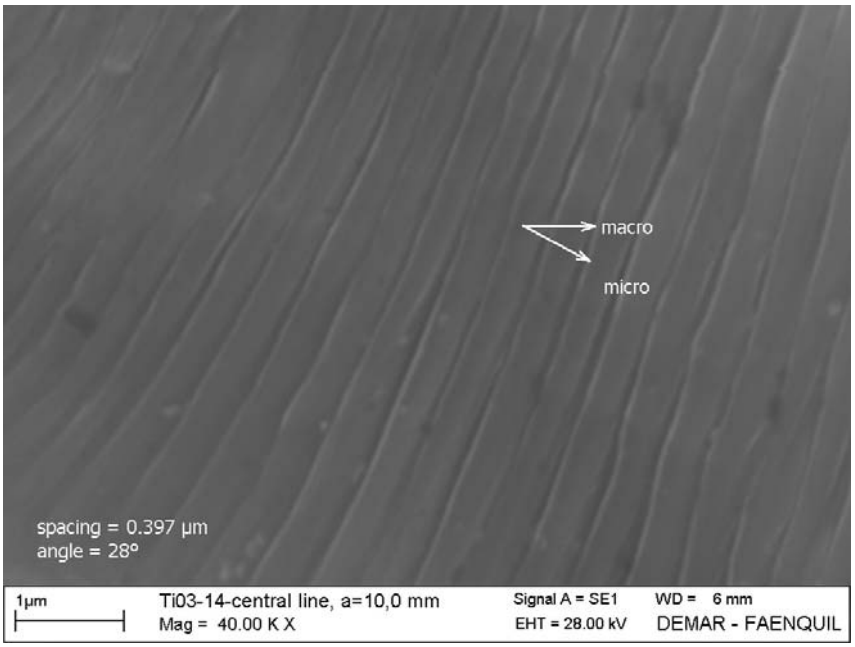


FIGURE 2 Representative SEM fractography of type B striation pattern (sample tested with R = 0.1 and *a* = 10.0 mm).

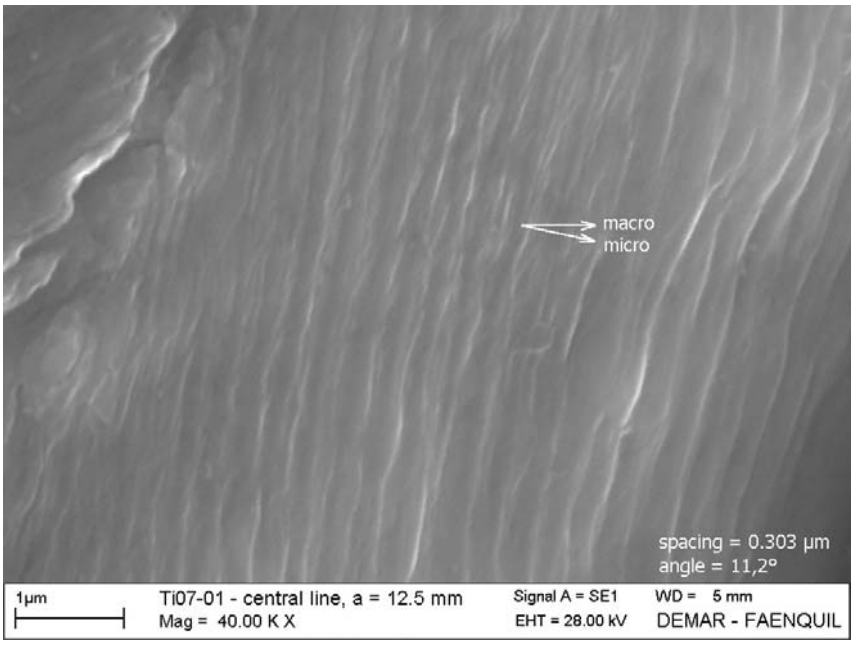


FIGURE 3 Representative SEM fractography of type C striation pattern (sample tested with R = 0.3 and *a* = 12.5 mm).

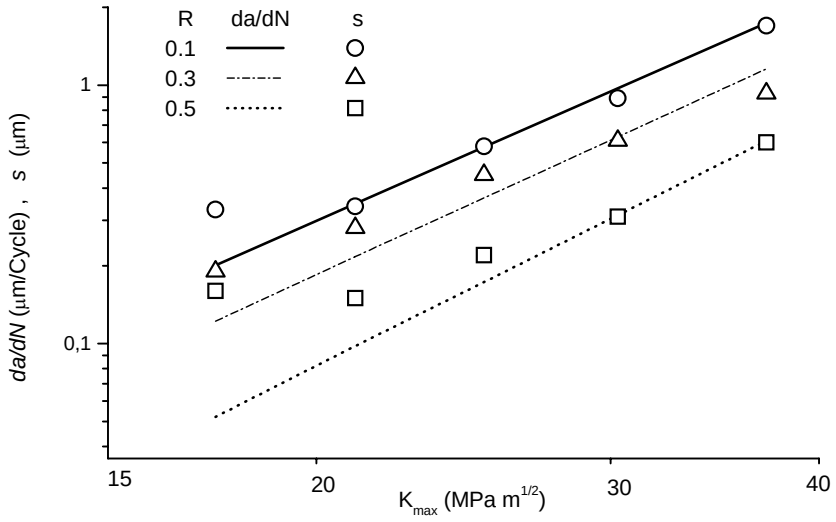


FIGURE 4 Fatigue crack growth rates and striation spacing.

SURFACE ANALYSIS OF DECIDUOUS TEETH AFTER SOFT DRINK ACTION

A. P. R. Alves; A. M. S. Lopes-Silva; D. Rodrigues Jr., MICROMAT 2002, Curitiba, PR.

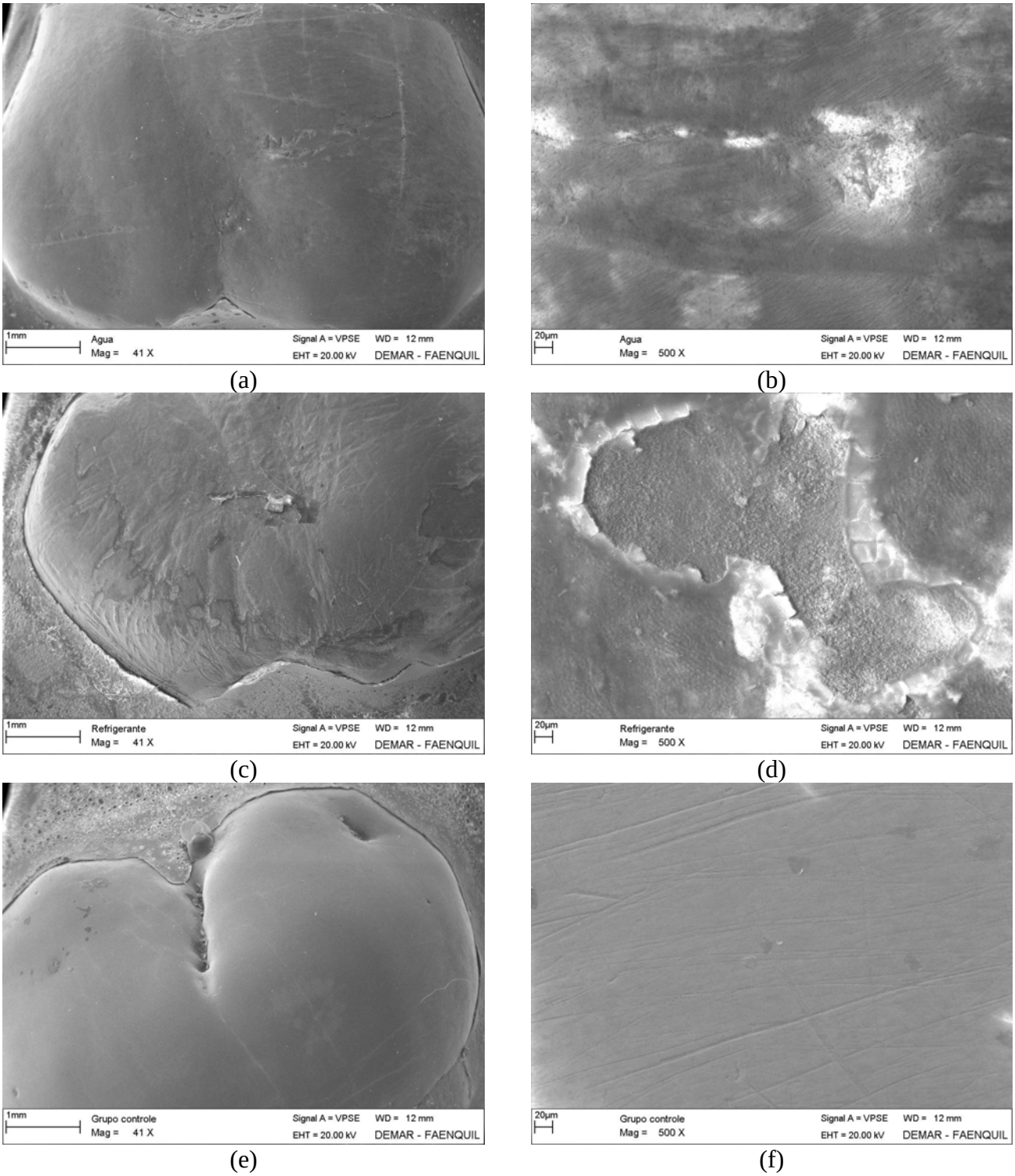
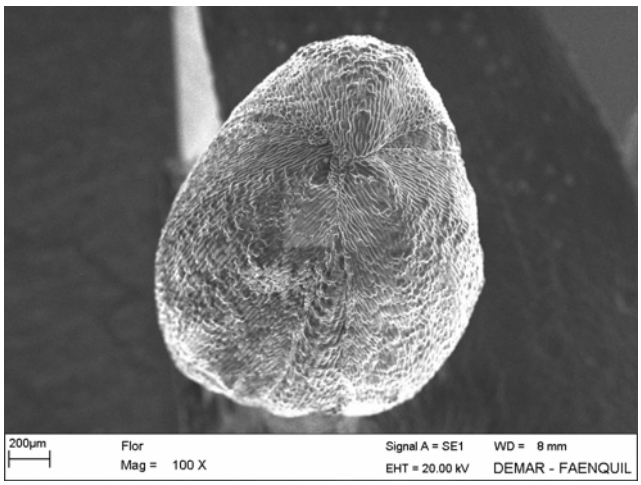
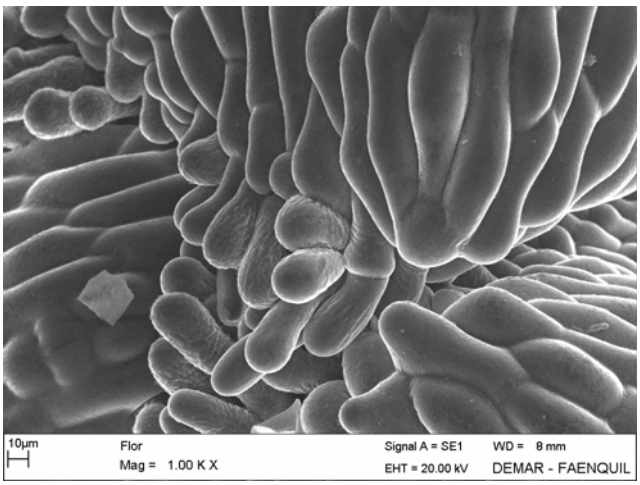
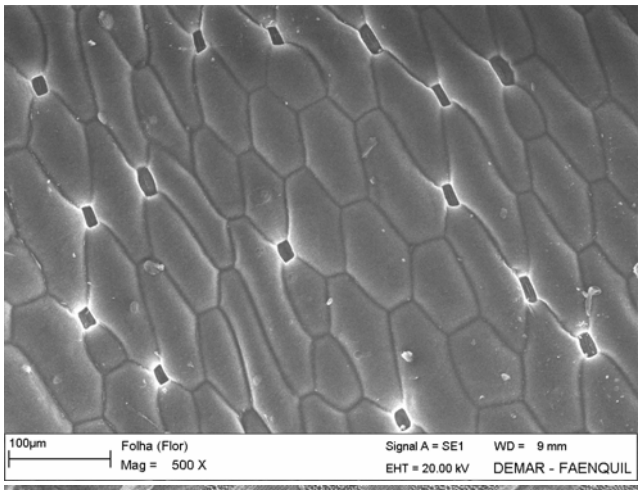
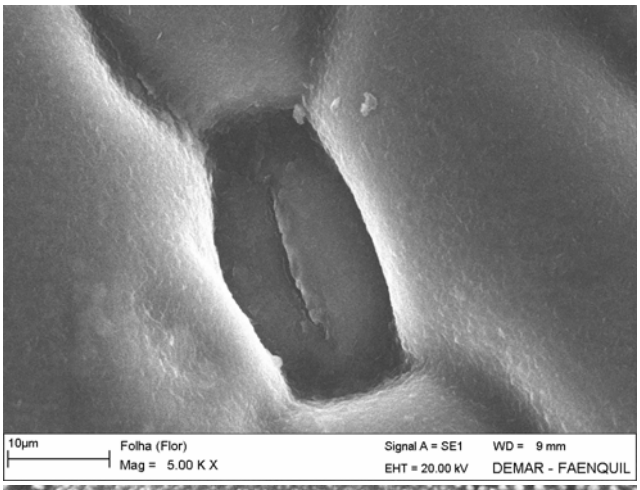


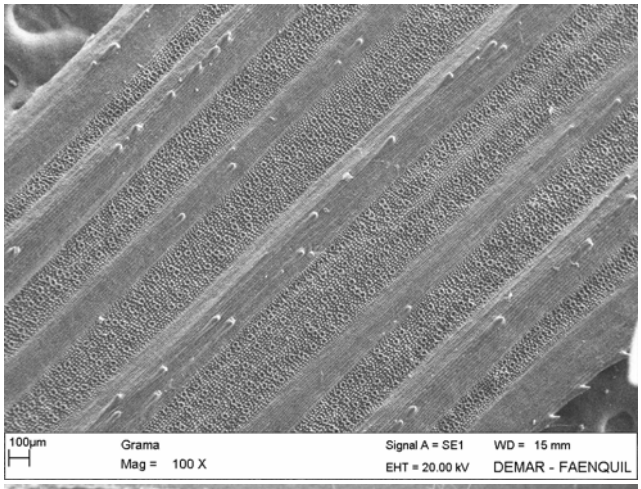
Figure 1. Teeth after storing and brushing in water, (a) 41X and (b) 500X; and in acid soft drink, (c) 41X and (d) 500X. One control tooth is shown in (e) 41X and (f) 500X.

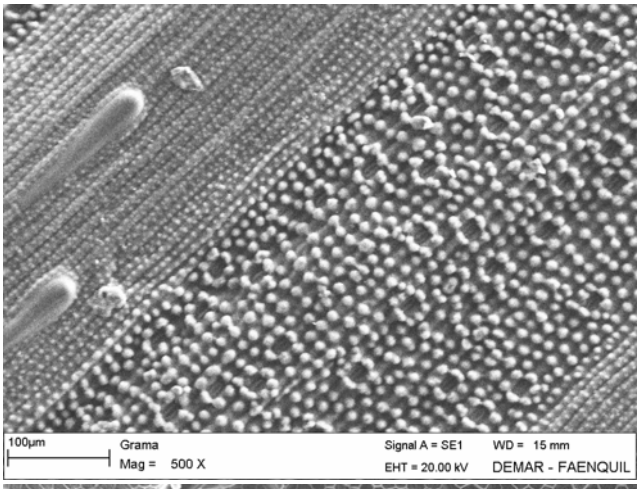

200µm
Flor
Mag = 100 X
Signal A = SE1
EHT = 20.00 kV
WD = 8 mm
DEMAR - FAENQUIL

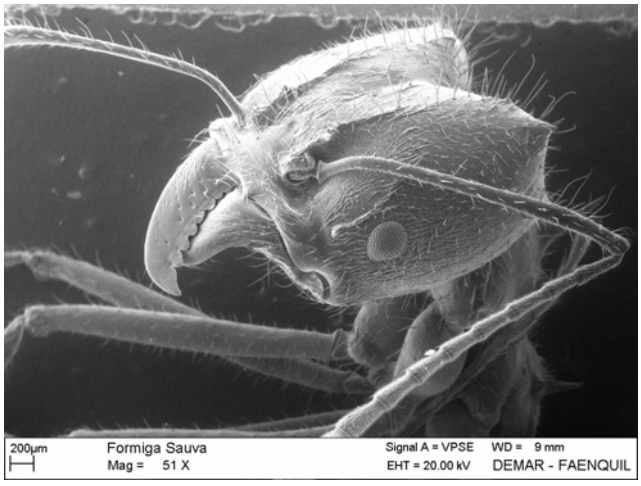

10µm
Flor
Mag = 1.00 K X
Signal A = SE1
EHT = 20.00 kV
WD = 8 mm
DEMAR - FAENQUIL

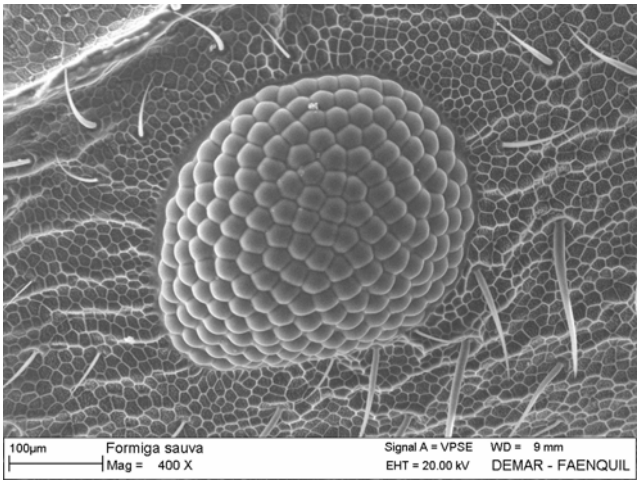

100µm
Folha (Flor)
Mag = 500 X
Signal A = SE1
EHT = 20.00 kV
WD = 9 mm
DEMAR - FAENQUIL

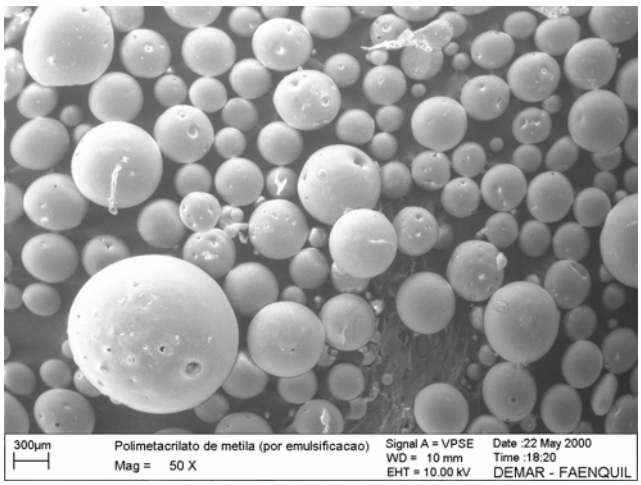

10µm
Folha (Flor)
Mag = 5.00 K X
Signal A = SE1
EHT = 20.00 kV
WD = 9 mm
DEMAR - FAENQUIL

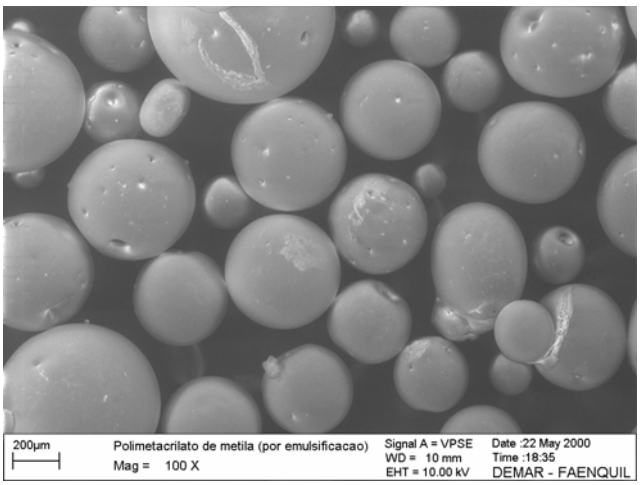

100µm
Grama
Mag = 100 X
Signal A = SE1
EHT = 20.00 kV
WD = 15 mm
DEMAR - FAENQUIL

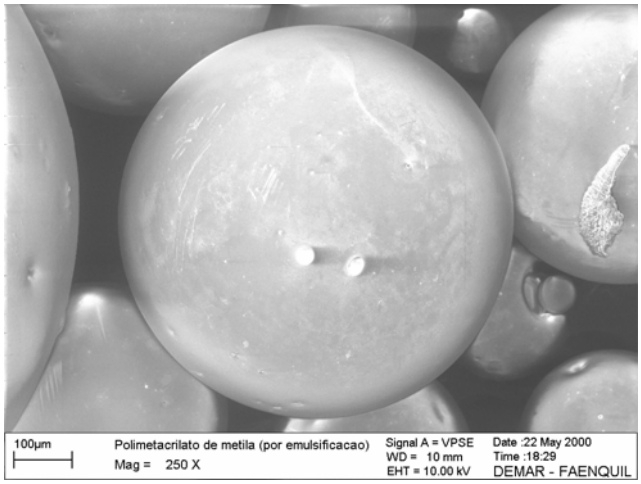

100µm
Grama
Mag = 500 X
Signal A = SE1
EHT = 20.00 kV
WD = 15 mm
DEMAR - FAENQUIL

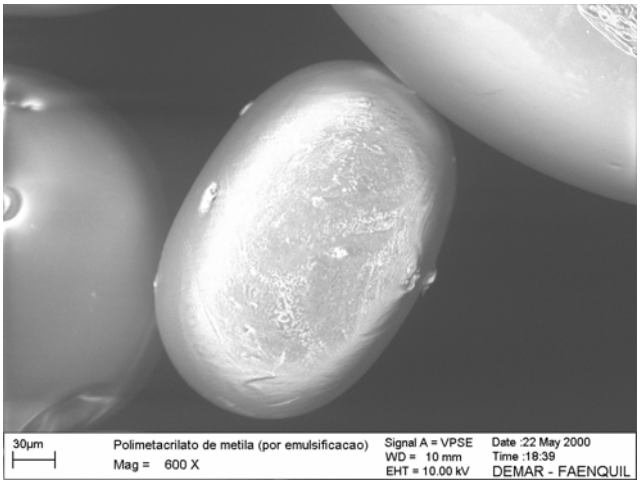

200µm
Formiga Sauva
Mag = 51 X
Signal A = VPSE
EHT = 20.00 kV
WD = 9 mm
DEMAR - FAENQUIL

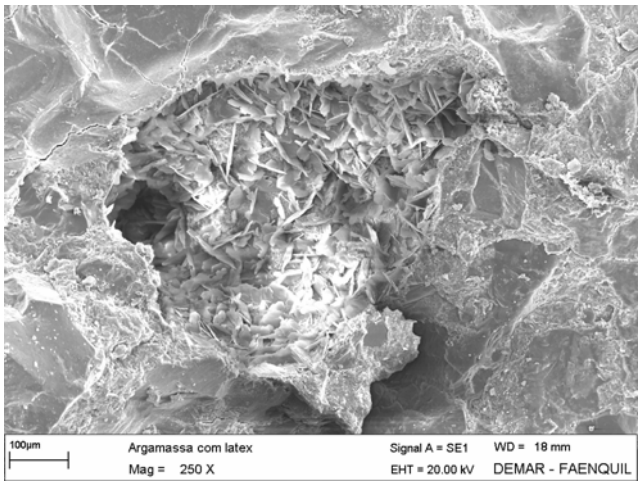

100µm
Formiga sauva
Mag = 400 X
Signal A = VPSE
EHT = 20.00 kV
WD = 9 mm
DEMAR - FAENQUIL

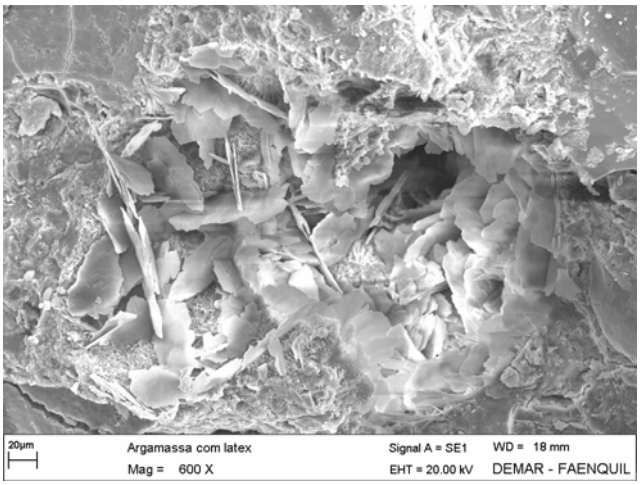

300µm
Polimetacrilato de metila (por emulsificacao)
Mag = 50 X
Signal A = VPSE
WD = 10 mm
EHT = 10.00 kV
Date :22 May 2000
Time :18:20
DEMAR - FAENQUIL


200µm
Polimetacrilato de metila (por emulsificacao)
Mag = 100 X
Signal A = VPSE
WD = 10 mm
EHT = 10.00 kV
Date :22 May 2000
Time :18:35
DEMAR - FAENQUIL


100µm
Polimetacrilato de metila (por emulsificacao)
Mag = 250 X
Signal A = VPSE
WD = 10 mm
EHT = 10.00 kV
Date :22 May 2000
Time :18:29
DEMAR - FAENQUIL


30µm
Polimetacrilato de metila (por emulsificacao)
Mag = 600 X
Signal A = VPSE
WD = 10 mm
EHT = 10.00 kV
Date :22 May 2000
Time :18:39
DEMAR - FAENQUIL


100µm
Argamassa com latex
Mag = 250 X
Signal A = SE1
WD = 18 mm
EHT = 20.00 kV
DEMAR - FAENQUIL


20µm
Argamassa com latex
Mag = 600 X
Signal A = SE1
WD = 18 mm
EHT = 20.00 kV
DEMAR - FAENQUIL