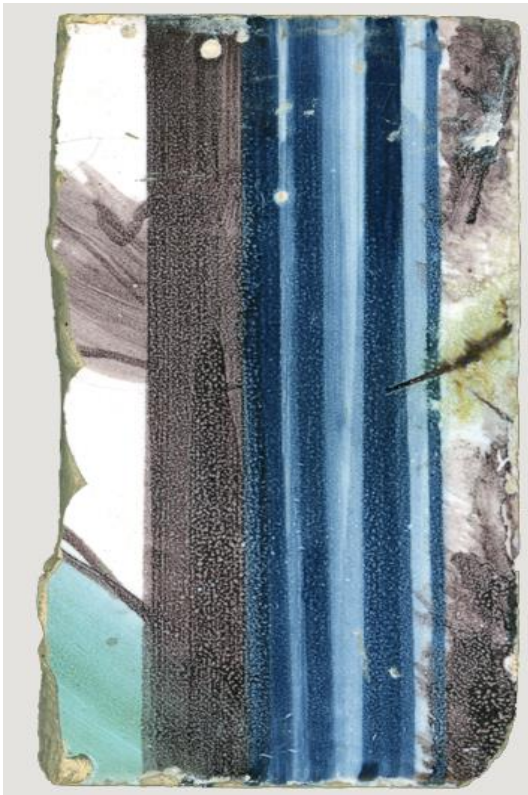


AzuRe176



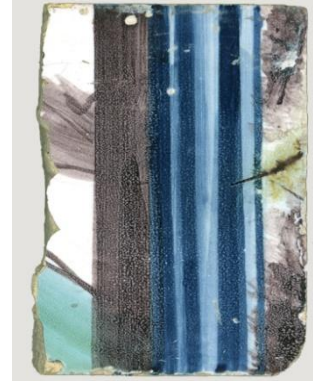
Descrição: Fragmento de azulejo do século XVIII (1760-1780);
Dimensões: 55 x 129 x 11 mm; Origem: Coimbra.

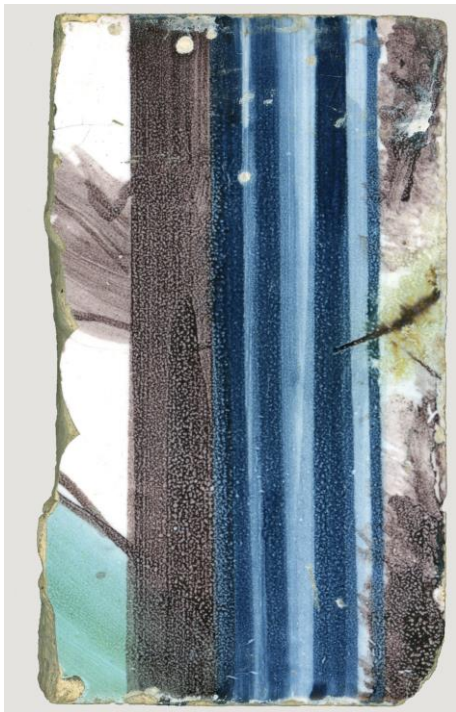
Amostras: Fragmento e secção semi-polida em depósito no
Museu Nacional do Azulejo em Lisboa.

Índice

AzuRe176

- **Caracterização Morfológica**
 - ✓ Imagens macroscópicas
 - ✓ Imagens de microscopia ótica (OM)
 - ✓ Imagens de microscopia electrónica (SEM)
- **Caracterização Física**
 - ✓ Propriedades hídricas / Porosidade
 - ✓ Porosimetria de mercúrio
- **Caracterização Química/Mineralógica**
 - ✓ Análise por SEM/EDS
 - ✓ Análise por XRD
 - ✓ Análise Térmica por TGA/DTA





Fragmento de azulejo em bom estado de conservação.

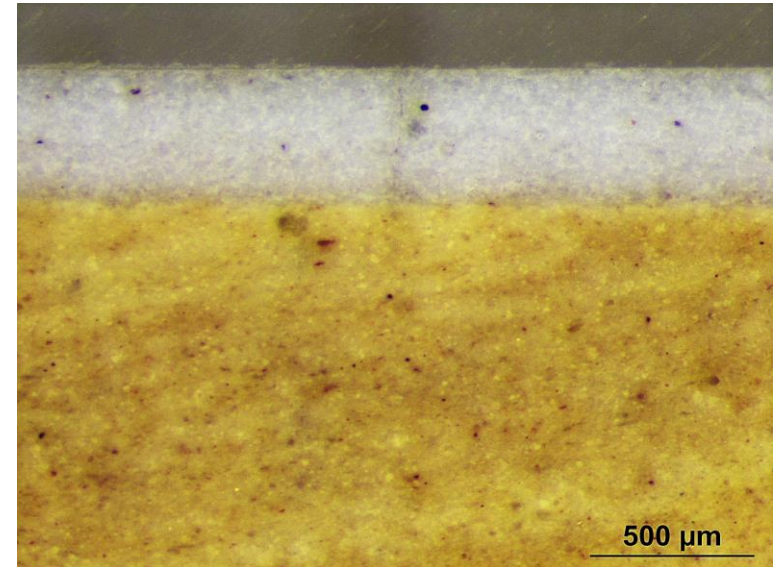
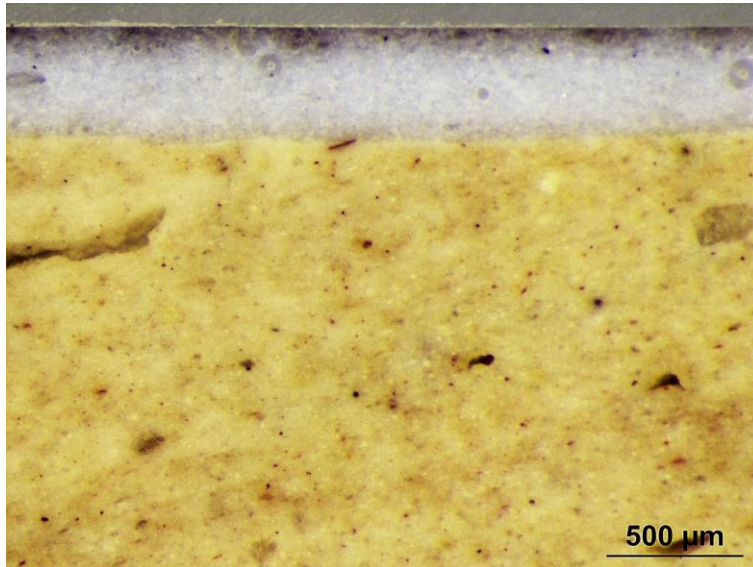
Apresenta craquelé pouco evidente.



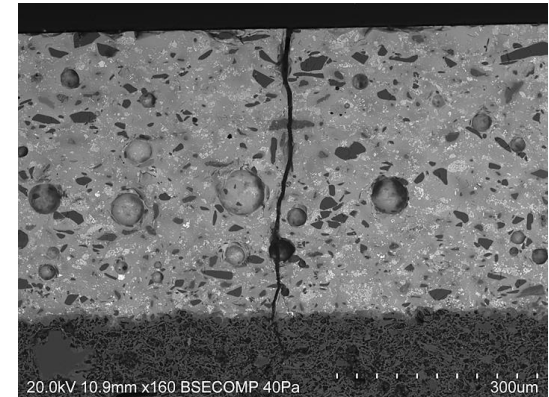
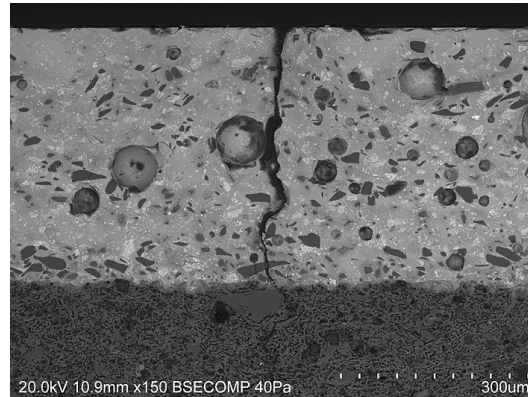
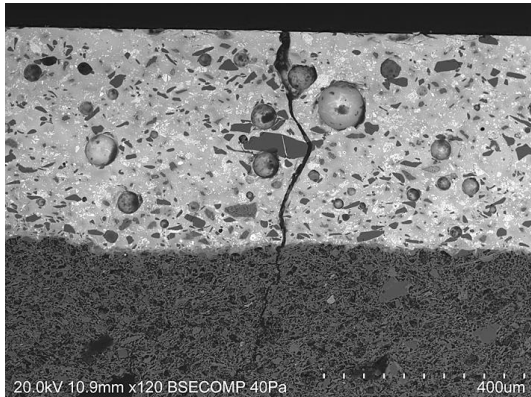
- Espessura do Azulejo = 11 mm



Chacota bege rosada compacta com alguns poros alongados e circulares; vazios alongados e algumas inclusões.



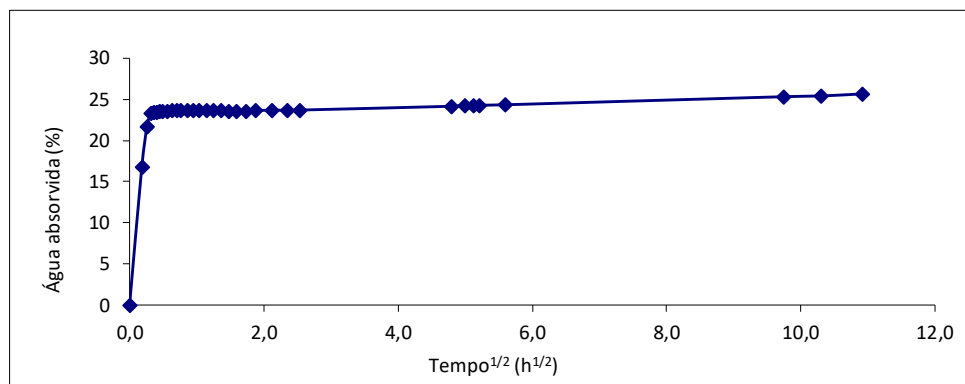
Equipamento: Lupa binocular Leica M80 com câmara incorporada.



- Observa-se craquelé.
- Espessura do Vidrado = 439-448 µm

Equipamento: Microscópio eletrónico de varrimento HITACHI 3700N acoplado a um espectrómetro de energia dispersiva de raios-X Bruker Xflash 5010.

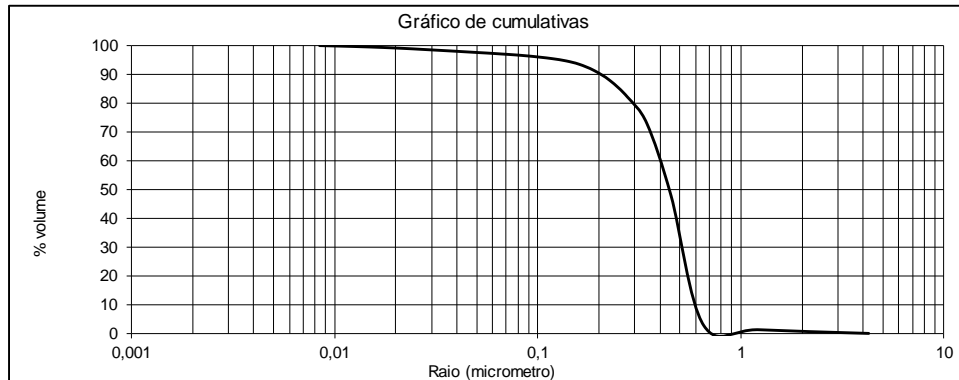
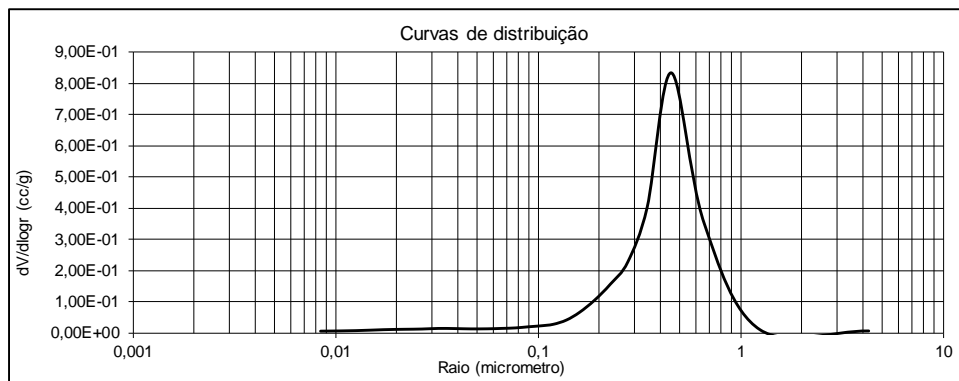
Curva de Absorção de Água (Chacota)



Massa volúmica real (kg/m³)	2738
Massa volúmica aparente (kg/m³)	1556
Porosidade aberta (vol %)	43
Coefficiente de capilaridade (kg/m²/h^{1/2})	13,5
Teor máximo de água (%)	26,9

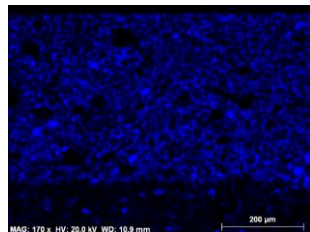
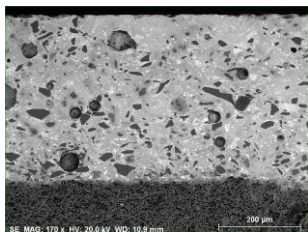
Procedimento: baseado na norma NP EN-13755.

Curvas de Porosimetria (Chacota)

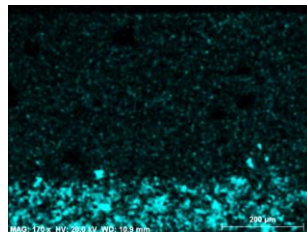


Procedimento: baseado na norma ASTM D4404-84.

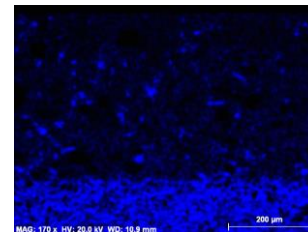
Equipamento: Porosímetro Quantachrome Autoscan



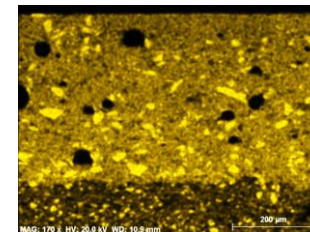
Na



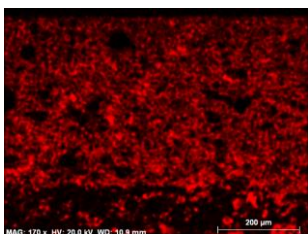
Mg



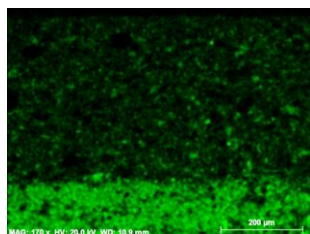
Al



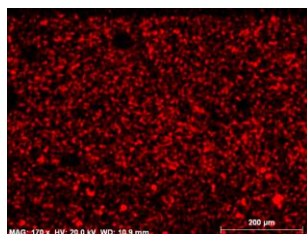
Si



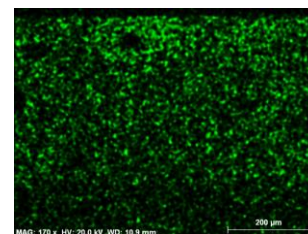
K



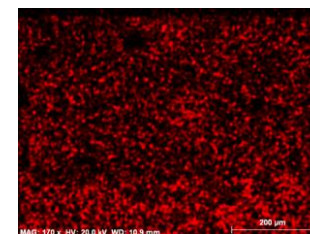
Ca



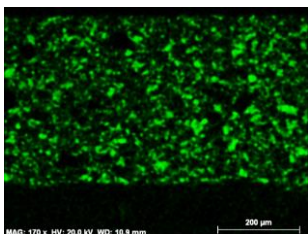
Ti



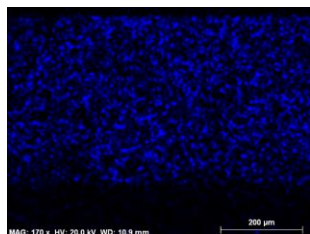
Mn



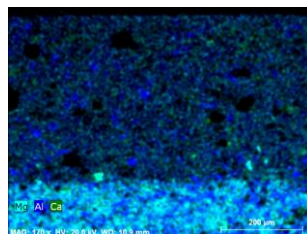
Fe



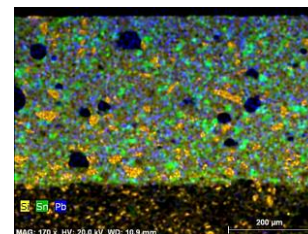
Sn



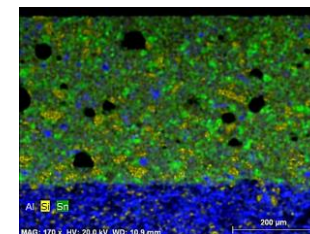
Pb



Combinação
Mg_Al_Ca



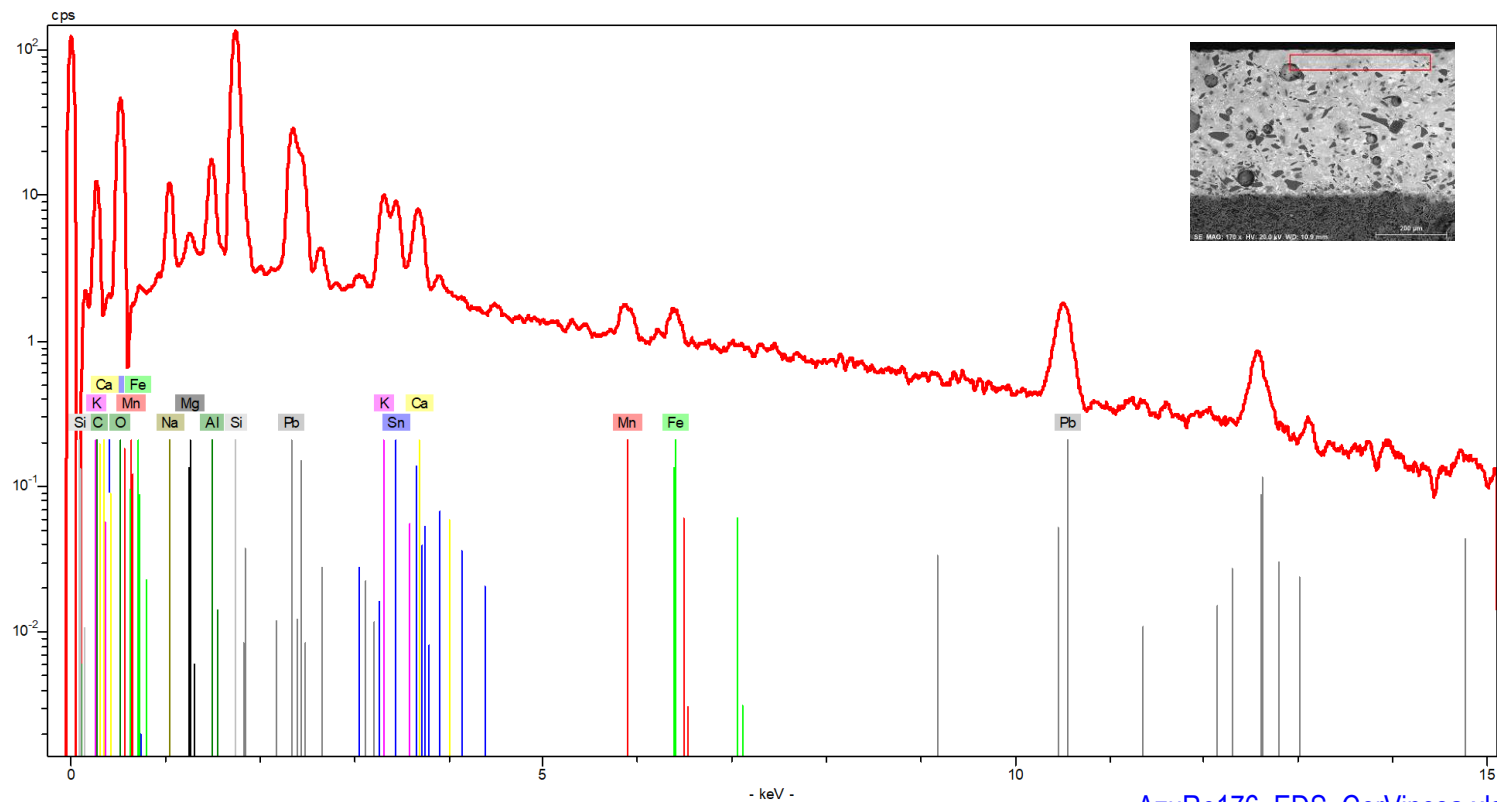
Combinação
Si_Sn_Pb



Combinação
Al_Si_Sn

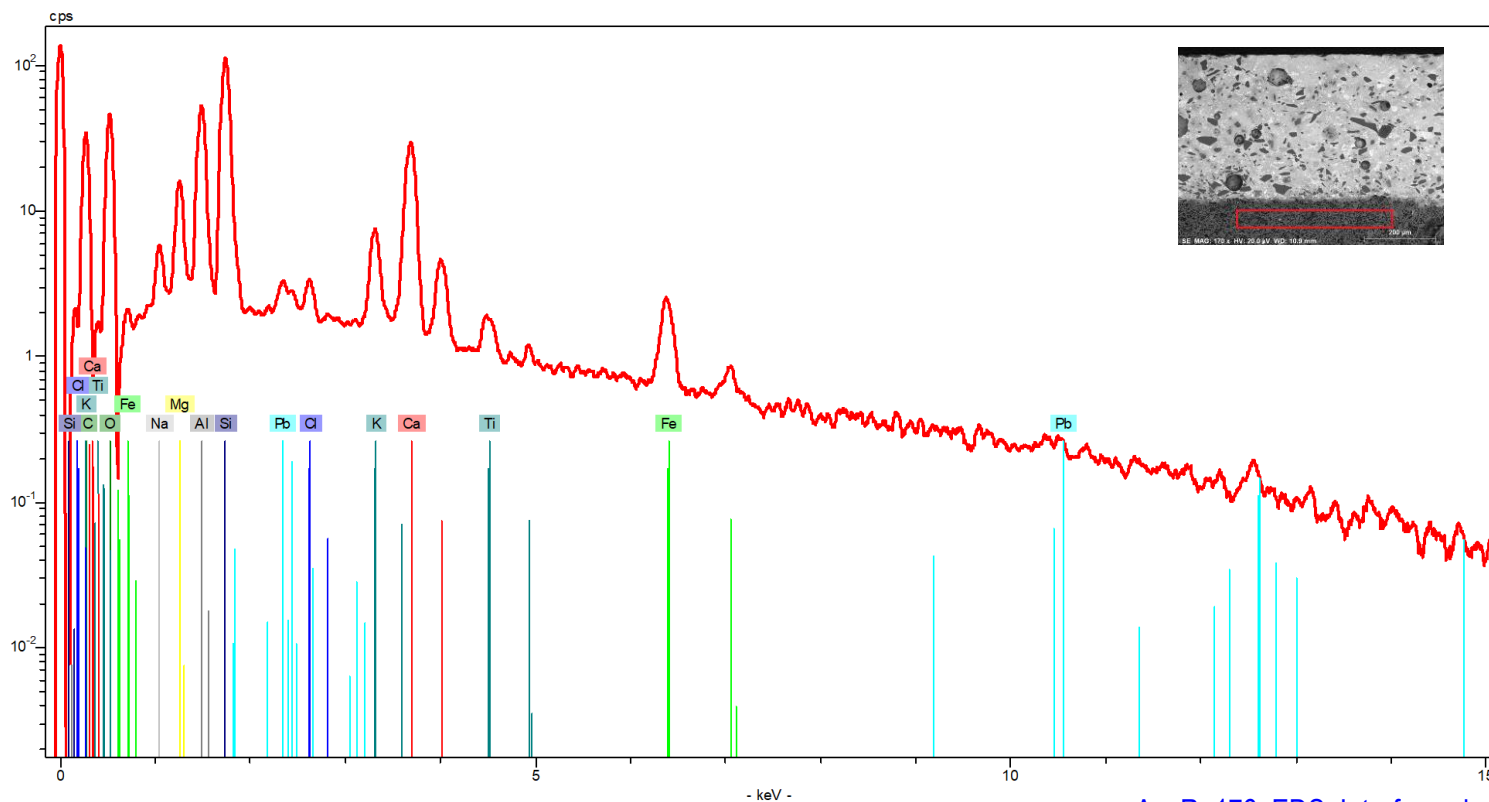
Equipamento: Microscópio eletrônico de varrimento HITACHI 3700N acoplado a um espectrómetro de energia dispersiva de raios-X Bruker Xflash 5010.

PIGMENTO DE COR VINOSA

[Azure176_EDS_CorVirosa.xls](#)

Equipamento: Microscópio eletrónico de varrimento HITACHI 3700N acoplado a um espectrómetro de energia dispersiva de raios-X Bruker Xflash 5010.

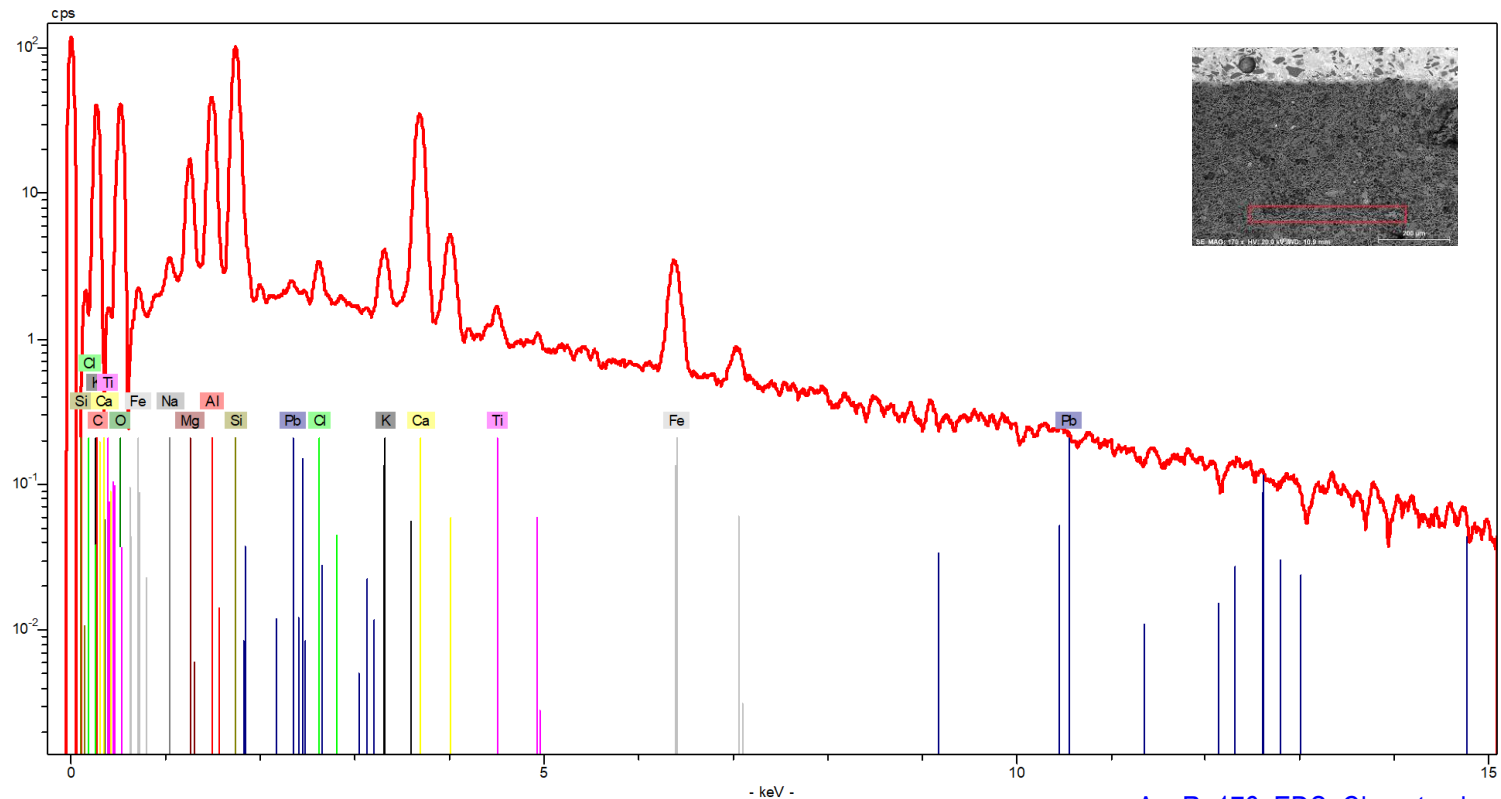
INTERFACE



[Azure176 EDS Interface.xls](#)

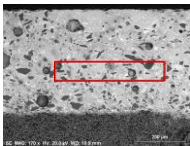
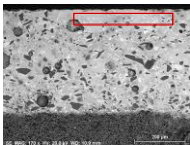
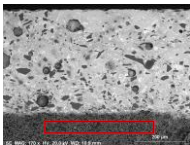
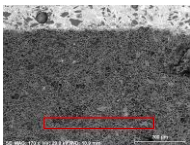
Equipamento: Microscópio eletrónico de varrimento HITACHI 3700N acoplado a um espectrómetro de energia dispersiva de raios-X Bruker Xflash 5010.

CHACOTA

[Azure176_EDS_Chacota.xls](#)

Equipamento: Microscópio eletrónico de varrimento HITACHI 3700N acoplado a um espectrómetro de energia dispersiva de raios-X Bruker Xflash 5010.

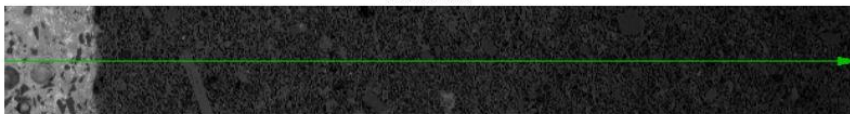
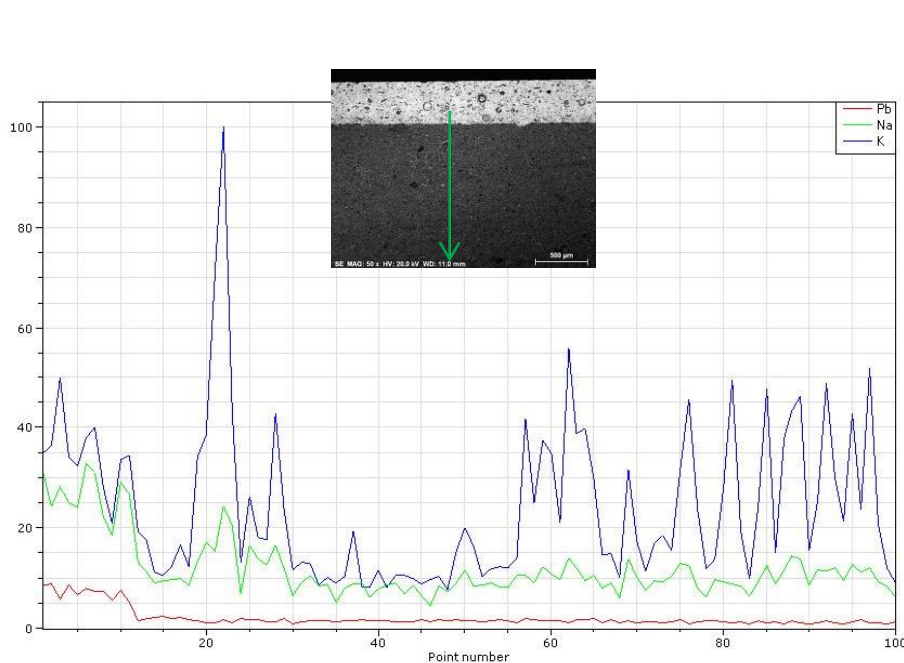
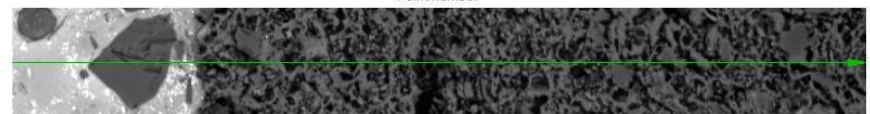
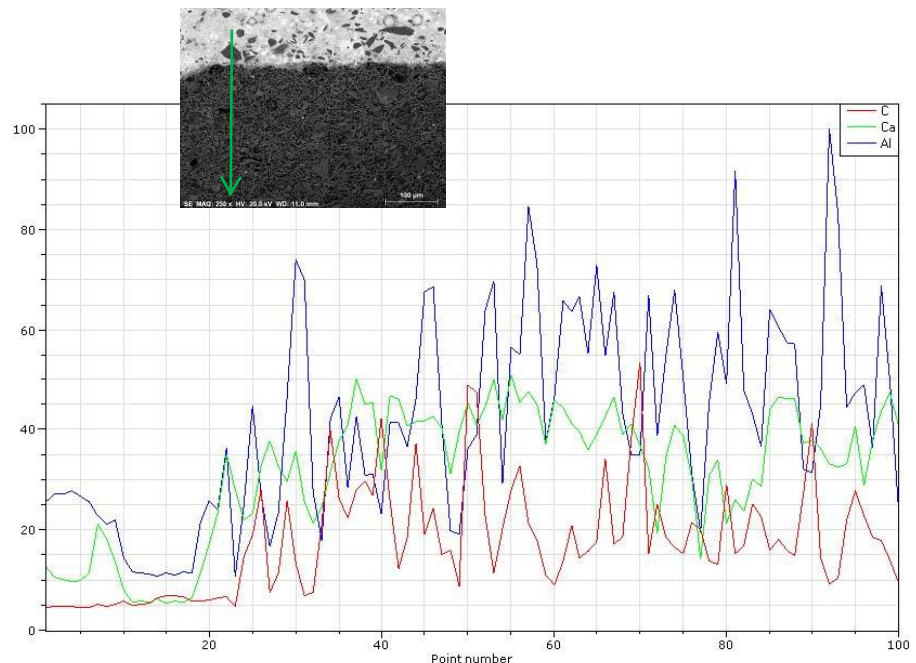
Composição química (% m/m)*

Área Analisada	Na	Mg	Al	Si	Cl	K	Ca	Ti	Mn	Fe	Sn	Pb
 vidrado branco	4,36	1,07	4,87	40,21	--	5,12	2,12	--	--	0,85	11,27	30,12
 pigmento de cor vinosa	5,03	1,07	4,73	35,08	--	4,95	2,12	--	0,86	0,91	11,04	34,22
 chacota (próximo interface)	1,90	5,24	18,53	39,71	1,04	4,08	13,03	1,26	--	6,76	--	1,45
 chacota	0,92	6,11	17,11	37,78	1,08	1,97	27,98	0,89	--	5,96	--	0,20

* - Os valores apresentados na tabela correspondem às percentagens mássicas dos elementos detetados na amostra, não considerando o teor de oxigénio e normalizados a 100% ([ver aviso](#)).

Equipamento: Microscópio eletrónico de varrimento HITACHI 3700N acoplado a um espectrómetro de energia dispersiva de raios-X Bruker Xflash 5010.

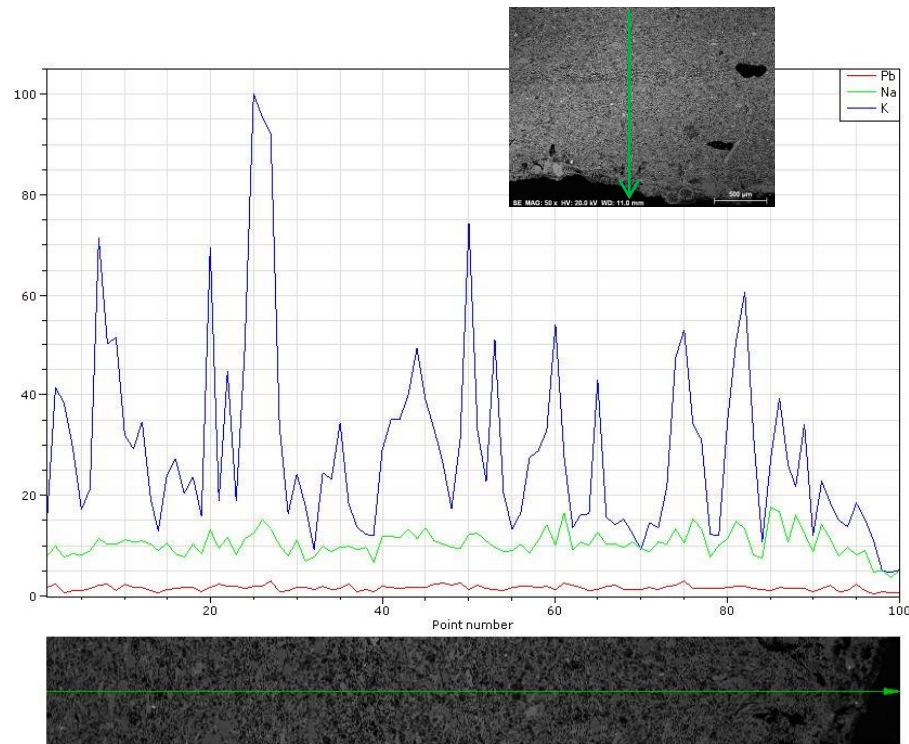
ANÁLISE EDS EM LINHA: Vidrado → Chacota

Elementos: **Pb** **Na** **K**[Azur176 EDS Perfil1.xls](#)Elementos: **C** **Ca** **Al**[Azur176 EDS Perfil2.xls](#)

Equipamento: Microscópio eletrónico de varrimento HITACHI 3700N acoplado a um espectrómetro de energia dispersiva de raios-X Bruker Xflash 5010.

AzuRe176 Caracterização Química: ANÁLISE POR SEM/EDS

ANÁLISE EDS EM LINHA: Chacota → Tardoz

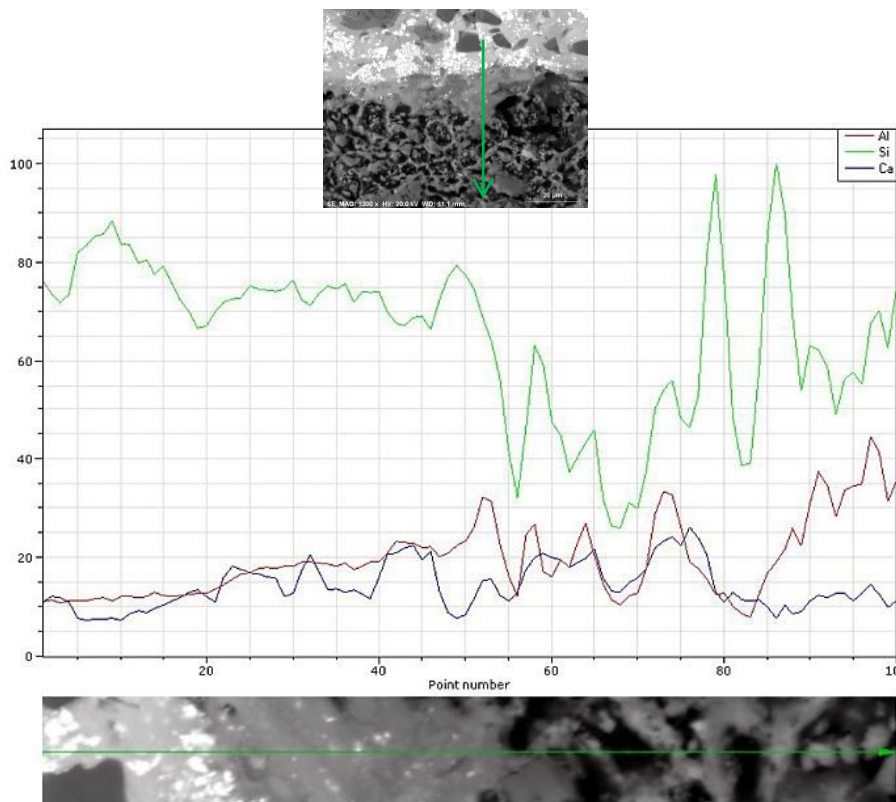
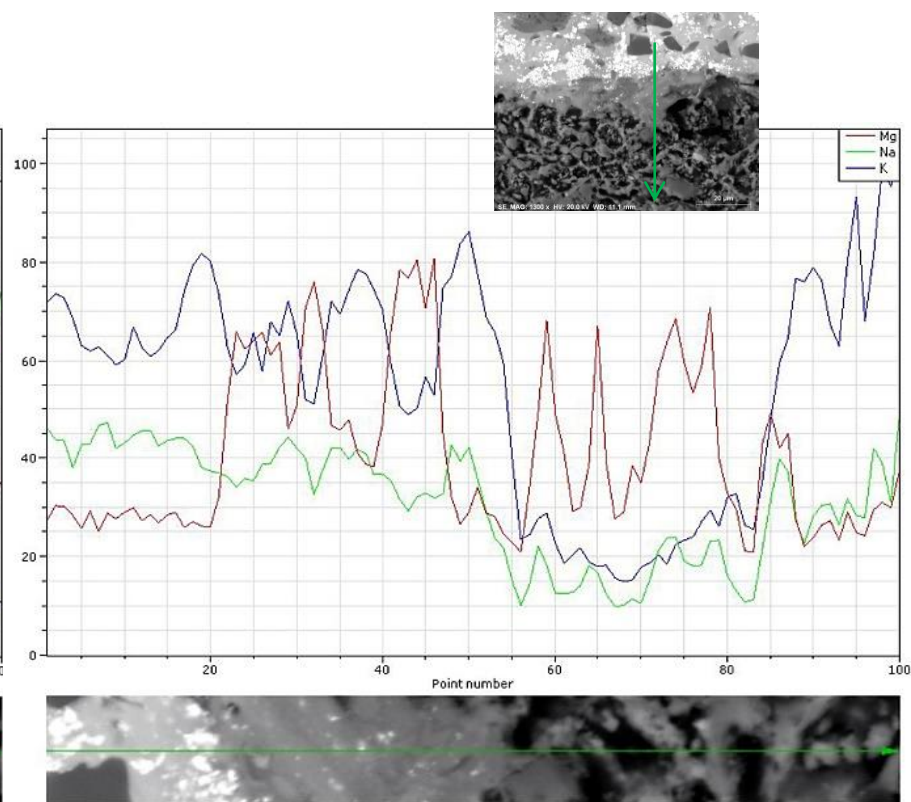


Elementos: **Pb** **Na** **K**

[AzuRe176 EDS Perfil3.xls](#)

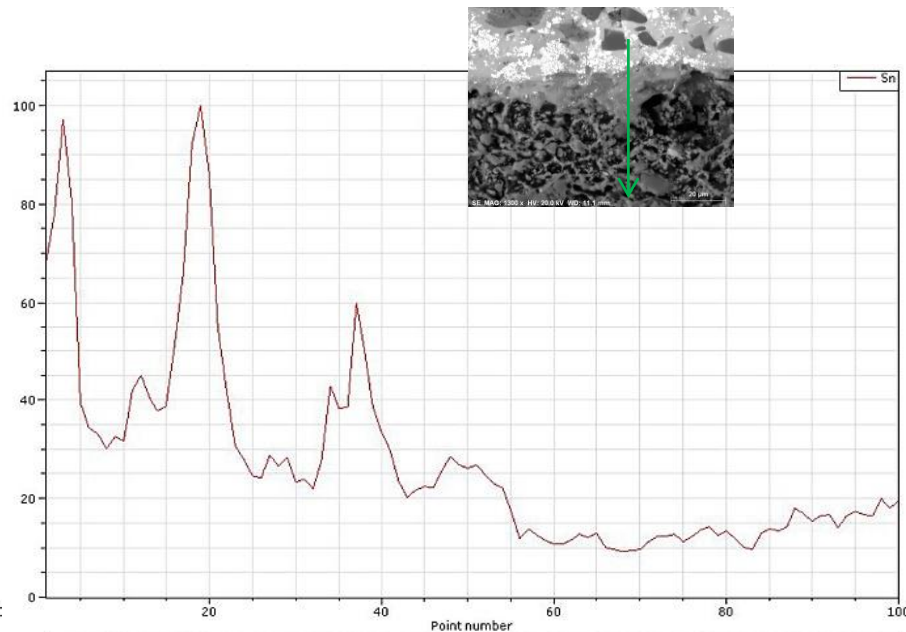
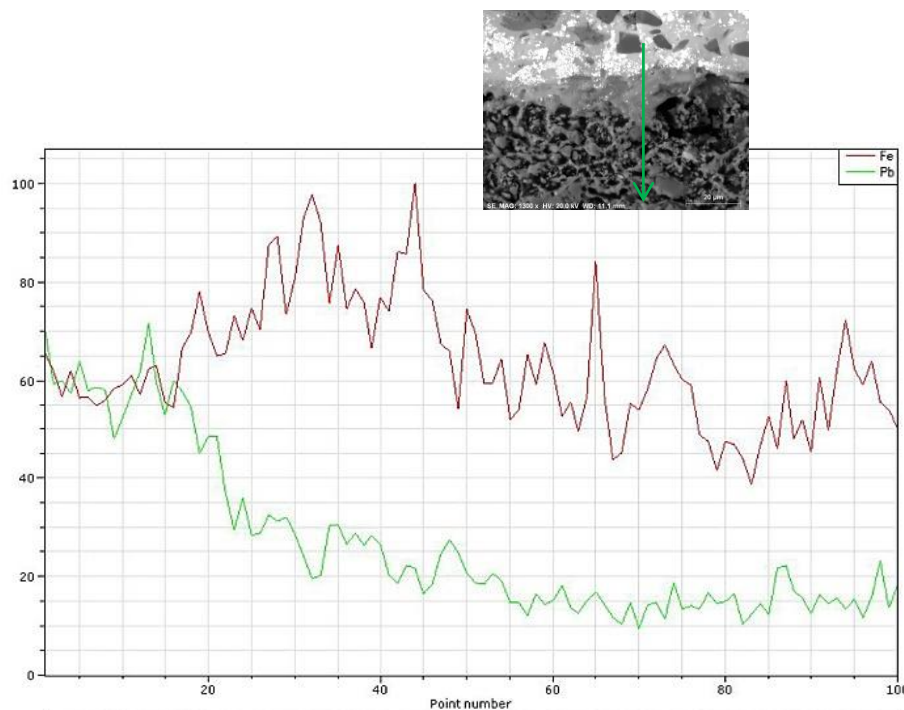
Equipamento: Microscópio eletrónico de varrimento HITACHI 3700N acoplado a um espectrómetro de energia dispersiva de raios-X Bruker Xflash 5010.

ANÁLISE EDS EM LINHA: Vidrado → Interface → Chacota

Elementos: **Al**_Si_Ca[Azure176 EDS Perfil4.xls](#)Elementos: **Mg**_Na_K[Azure176 EDS Perfil5.xls](#)

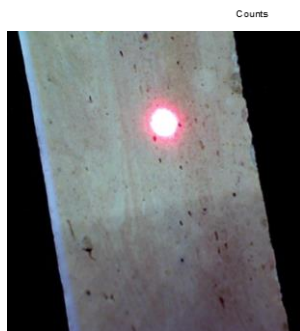
Equipamento: Microscópio eletrónico de varrimento HITACHI 3700N acoplado a um espectrómetro de energia dispersiva de raios-X Bruker Xflash 5010.

ANÁLISE EDS EM LINHA: Vidrado → Interface → Chacota

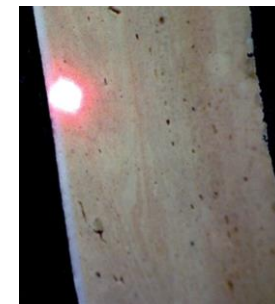
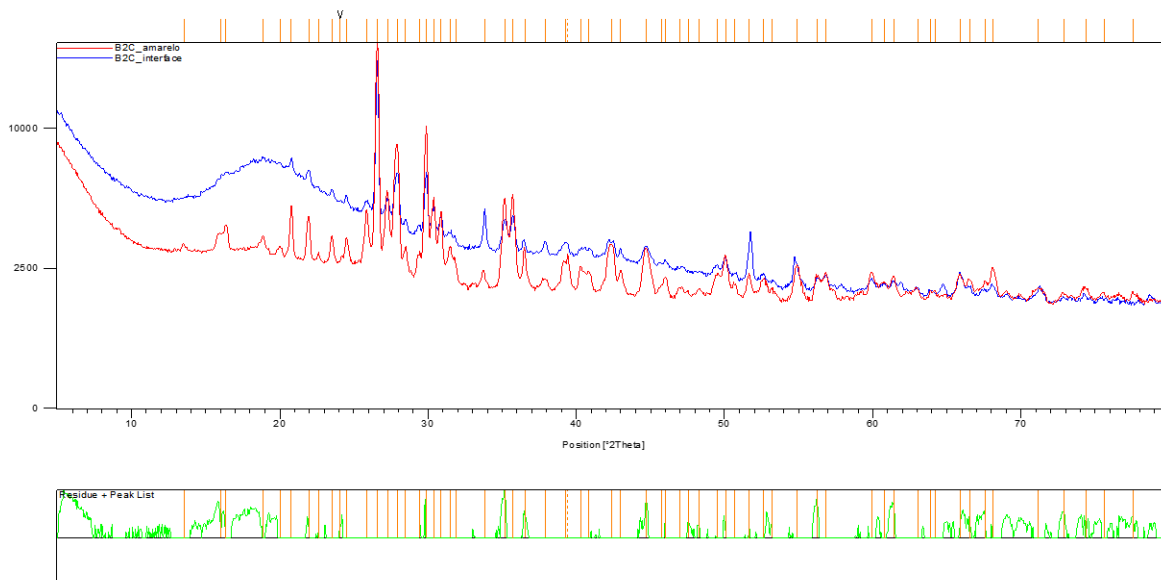
Elementos: **Fe_Pb**[Azure176_EDS_Perfil6.xls](#)Elemento: **Sn**[Azure176_EDS_Perfil7.xls](#)

Equipamento: Microscópio eletrónico de varrimento HITACHI 3700N acoplado a um espectrómetro de energia dispersiva de raios-X Bruker Xflash 5010.

ANÁLISE POR μ -XRD



chacota



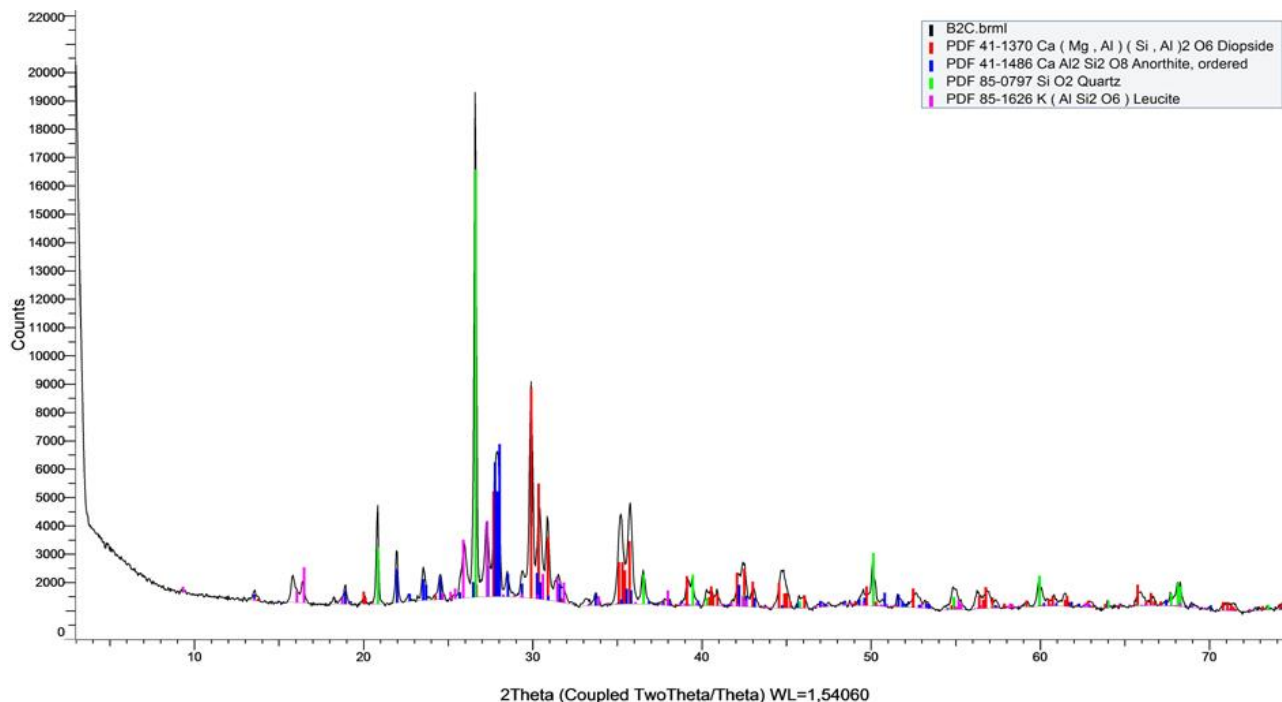
interface

Pattern List

Visible	Ref.Code	Score	Compound Name	Displ.[°2Th]	Scale Fac.	Chem. Formula
*	01-086-2237	60	Quartz low	-0,065	0,986	Si O ₂
*	00-041-1370	58	Diopside	0,002	0,588	Ca (Mg , Al) (S..
*	00-020-0020	53	Anorthite, ordered	-0,017	0,451	Ca Al ₂ Si ₂ O ₈
*	01-085-1626	35	Leucite	-0,044	0,261	K (Al Si ₂ O ₆)

Equipamento: Difratómetro de raio-X Bruker AXS-D8 Discover

CHACOTA

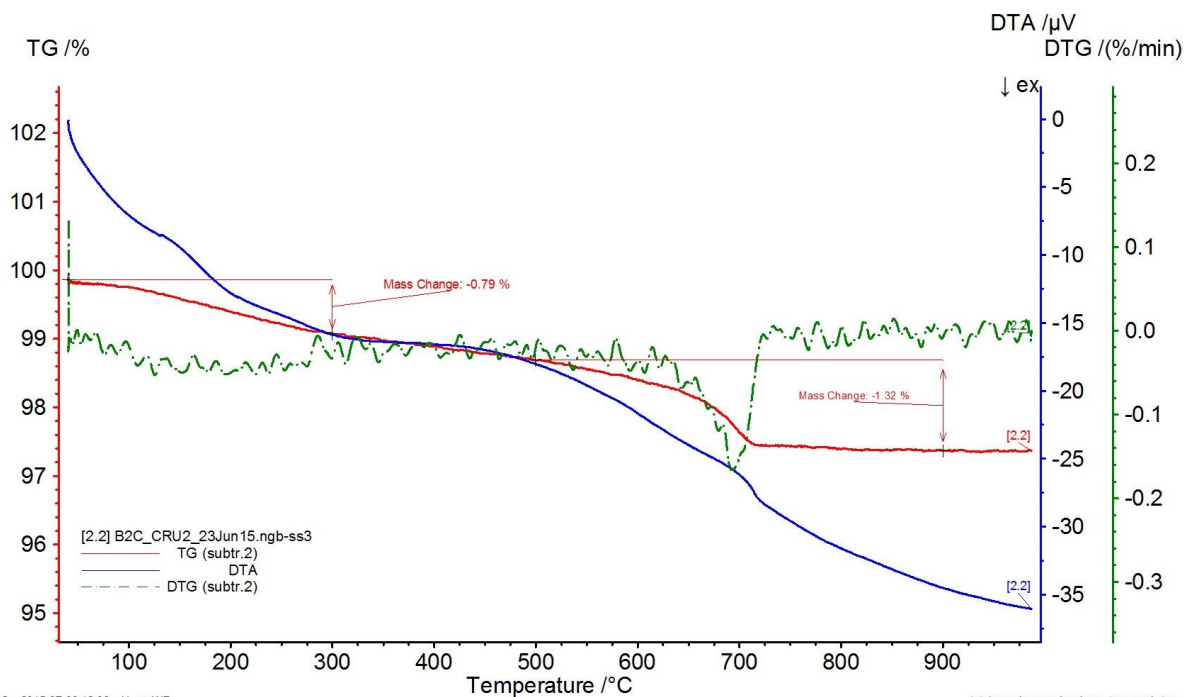


Composição mineralógica semi-quantitativa (% m/m)

Quartzo	Anortite	Diópsido	Leucite
SiO ₂	CaAl ₂ Si ₂ O ₈	Ca(Mg,Al)(Si,Al) ₂ O ₆	K(AlSi ₂ O ₆)
15,72	45,27	31,95	7,06

Equipamento: Difrátometro de raio-X Bruker AXS-D8 Discover

CHACOTA



B2C 2015-07-03 12:36 User: W7

total com brancosLurdes esteves.ngb-taa

Perda de massa (%)	Teor de carbonatos (%)
1,32	3

Equipamento: Analisador térmico TGA/DTA Netzsch STA 449 F3 Jupiter.