

# AzuRe180



**Descrição:** Azulejo do século XVIII-XIX (1790-1820);  
Origem: Lisboa.

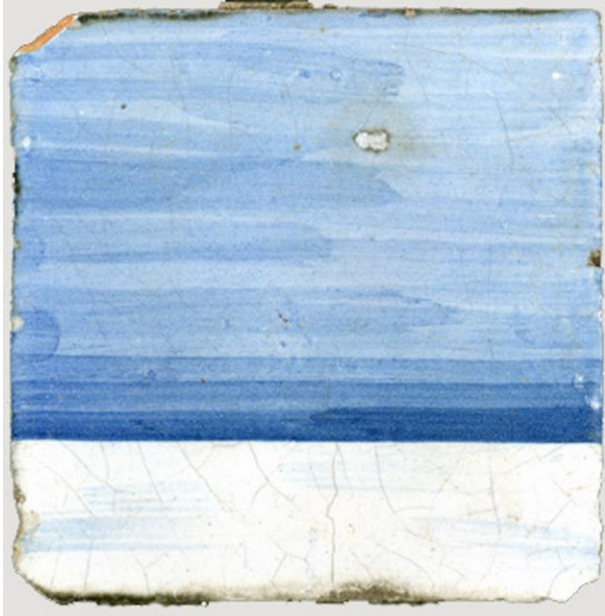
**Amostras:** Fragmentos e uma secção semi-polida em depósito  
no *Museu Nacional do Azulejo* em Lisboa.

# Índice

- **Caracterização Morfológica**
  - ✓ Imagens macroscópicas
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- **Caracterização Física**
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- **Caracterização Química/Mineralógica**
  - ✓ Análise por SEM/EDS
  - ✓ Análise por XRD
  - ✓ Análise Térmica por TGA/DTA

AzuRe180





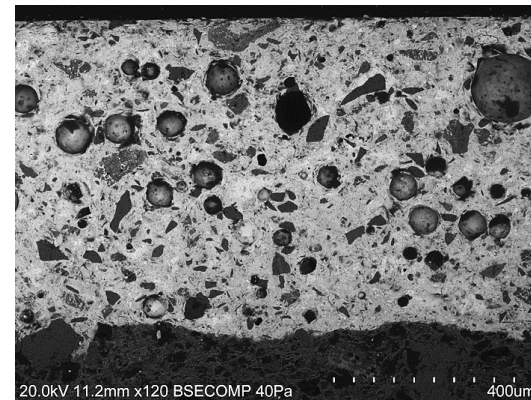
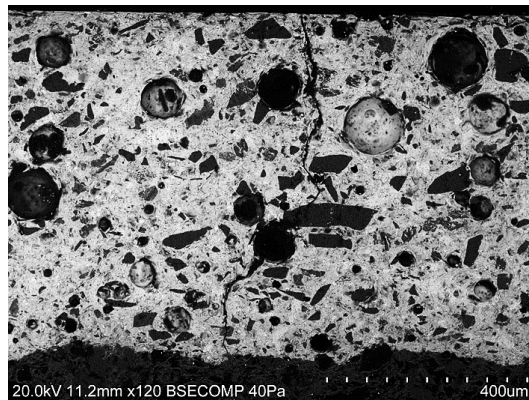
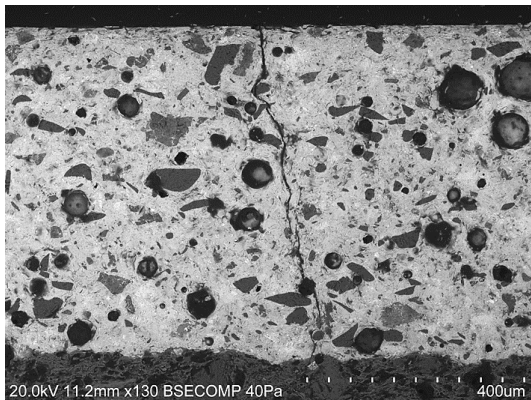
Azulejo com algumas linhas de craquelé.



- Espessura do Azulejo = 10 mm



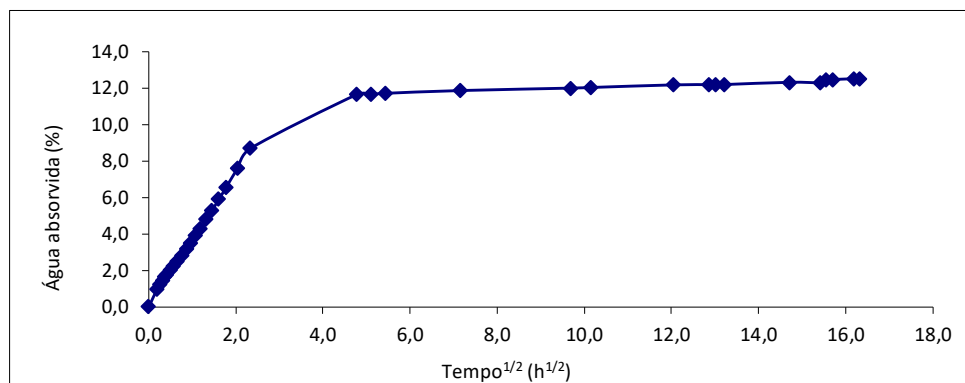
Chacota avermelhada compacta.



- Observa-se craquelé.
- Espessura do Vidrado = 617  $\mu\text{m}$

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

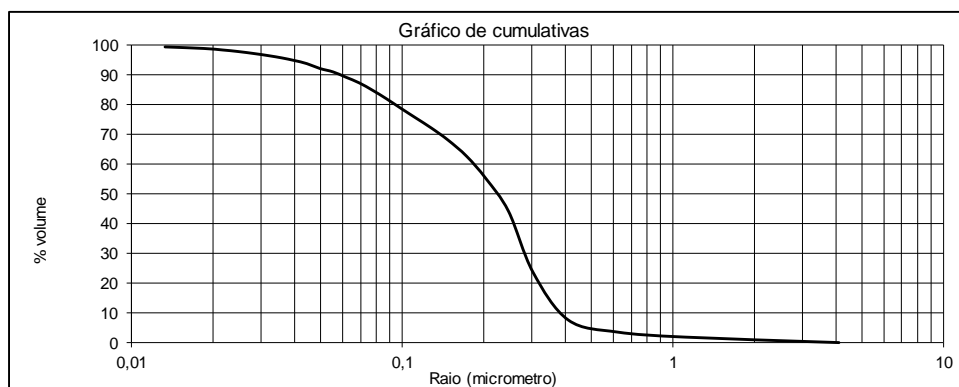
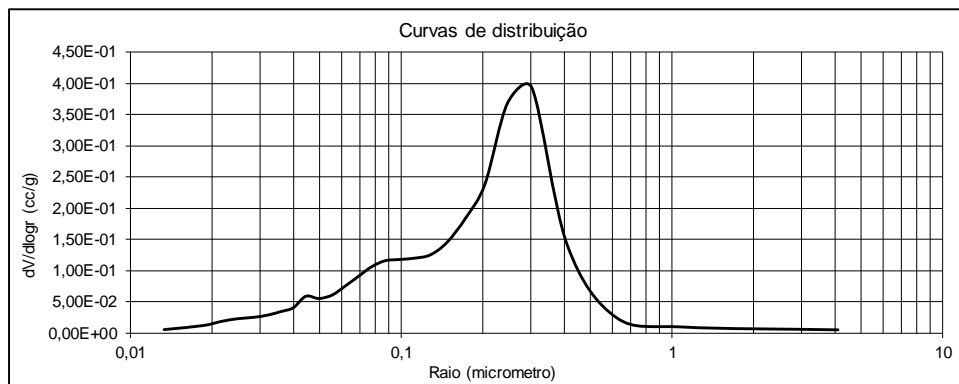
Curva de Absorção de Água (Chacota)



<b>Massa volúmica real (kg/m<sup>3</sup>)</b>	2869
<b>Massa volúmica aparente (kg/m<sup>3</sup>)</b>	1820
<b>Porosidade aberta (vol %)</b>	33,6
<b>Coefficiente de capilaridade (kg/m<sup>2</sup>/h<sup>1/2</sup>)</b>	0,6
<b>Teor máximo de água (%)</b>	17,9

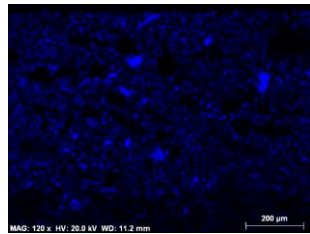
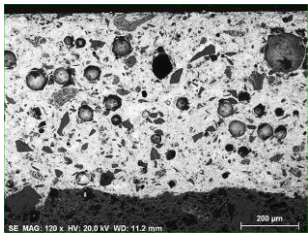
Procedimento: baseado na norma NP EN-13755.

## Curvas de Porosimetria (Chacota)

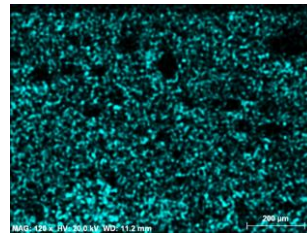


Procedimento: baseado na norma ASTM D4404-84.

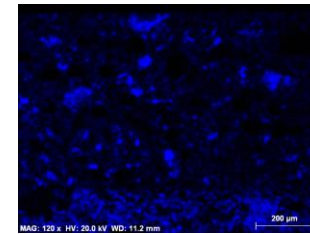
Equipamento: Porosímetro Quantachrome Autoscan



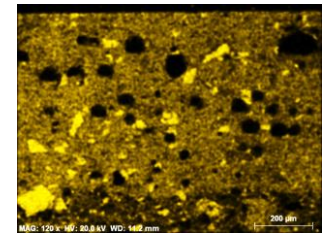
Na



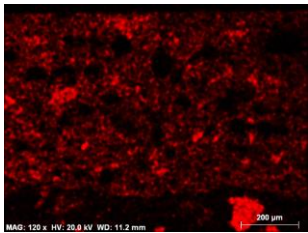
Mg



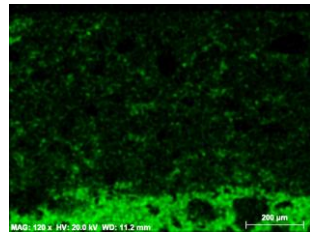
Al



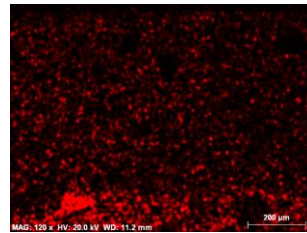
Si



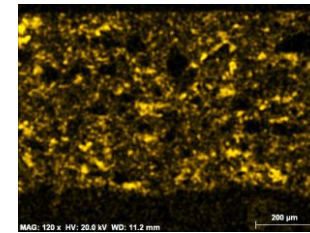
K



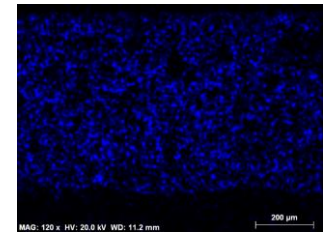
Ca



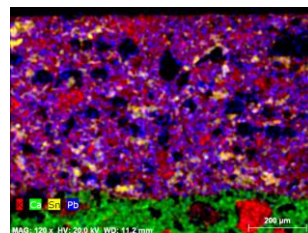
Fe



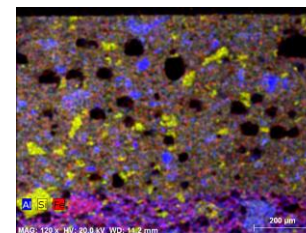
Sn



Pb



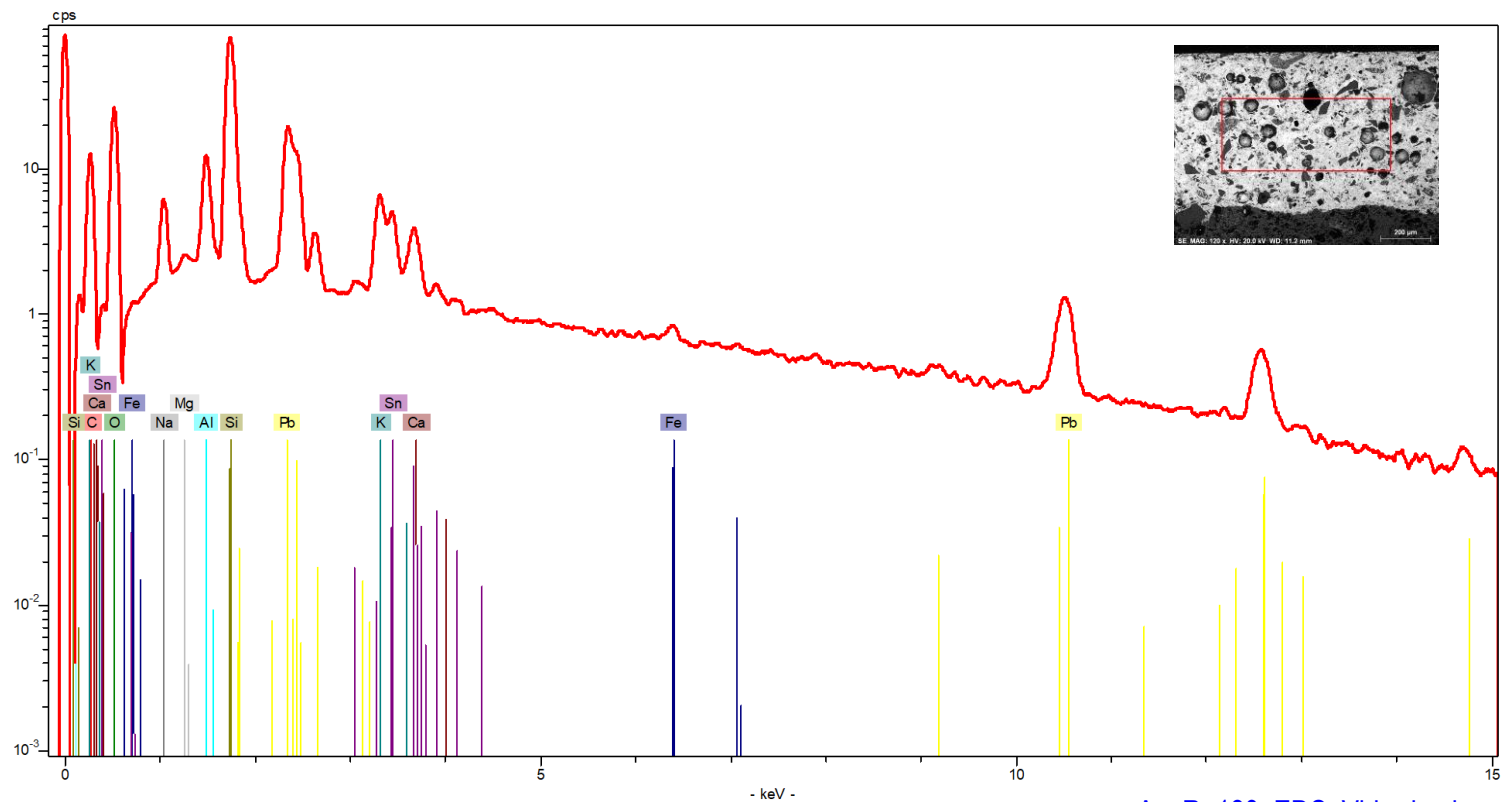
Combinação  
K\_Ca\_Sn\_Pb



Combinação  
Al\_Si\_Fe

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

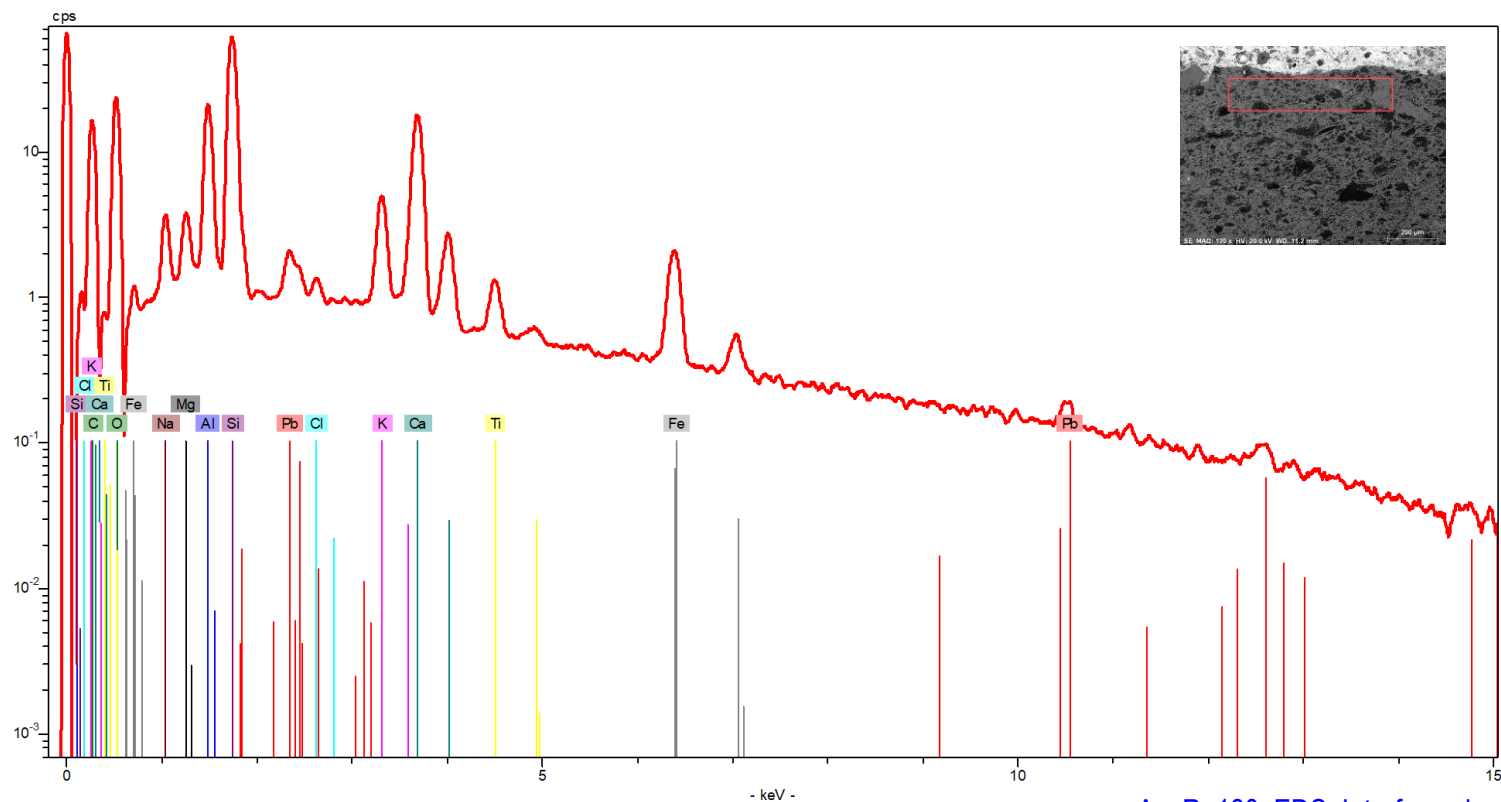
## VIDRADO BRANCO

[AzuRe180\\_EDS\\_Vidrado.xls](#)

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



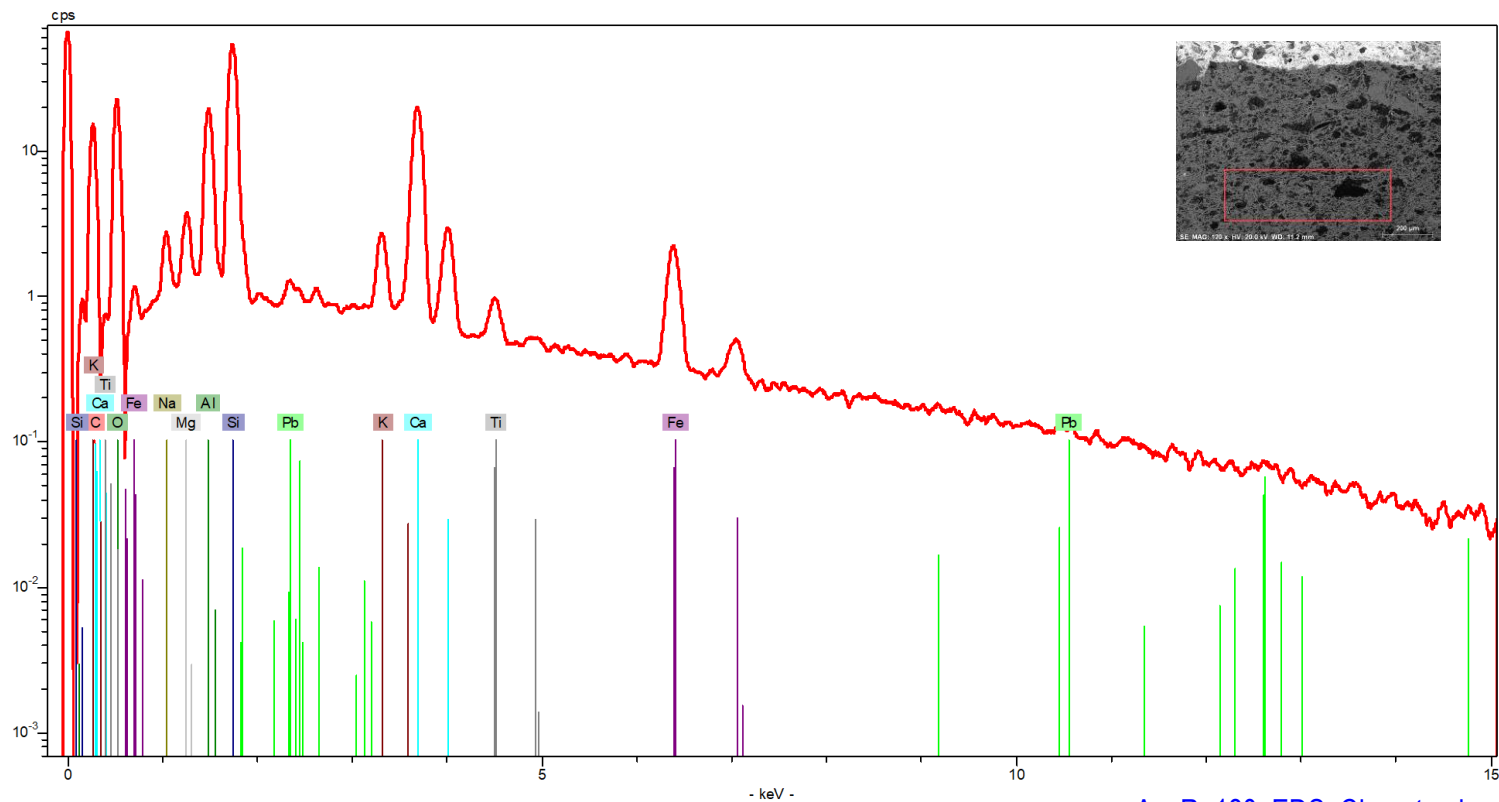
## INTERFACE



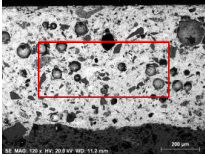
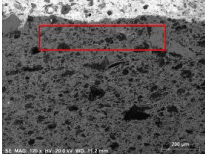
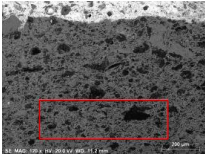
[Azure180 EDS Interface.xls](#)

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

## CHACOTA

[AzuRe180\\_EDS\\_Chacota.xls](#)

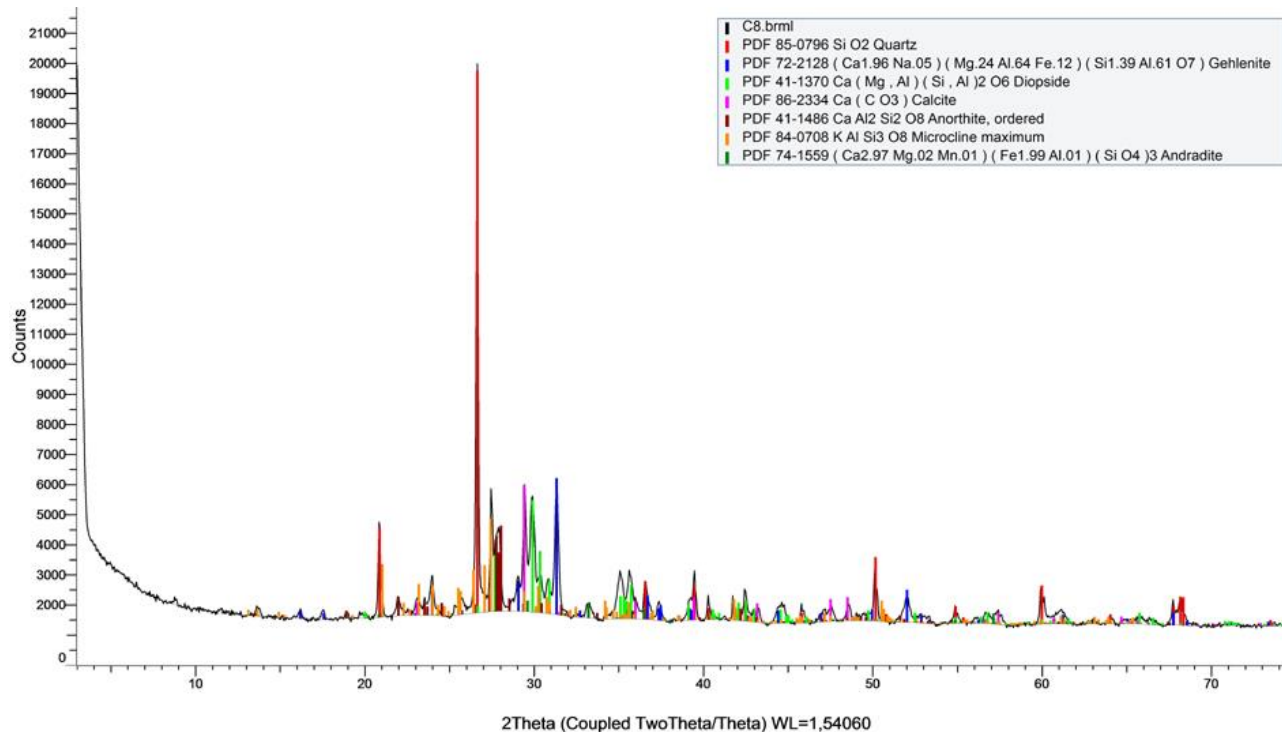
**Equipamento:** Microscópio eletrónico de varrimento HITACHI 3700N acoplado a um espectrómetro de energia dispersiva de raios-X Bruker Xflash 5010.

Área Analisada	Composição química (% m/m)*										
	Na	Mg	Al	Si	Cl	K	Ca	Ti	Fe	Sn	Pb
 <b>vidrado branco</b>	3,09	0,11	4,44	28,78	--	4,71	0,92	--	0,41	8,39	49,15
 <b>chacota (próximo interface)</b>	2,43	1,62	13,01	35,89	0,08	4,96	26,65	1,68	7,54	--	6,14
 <b>chacota</b>	1,78	1,88	13,33	35,04	--	2,48	32,57	1,04	8,99	--	2,90

\* - 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.

CHACOTA

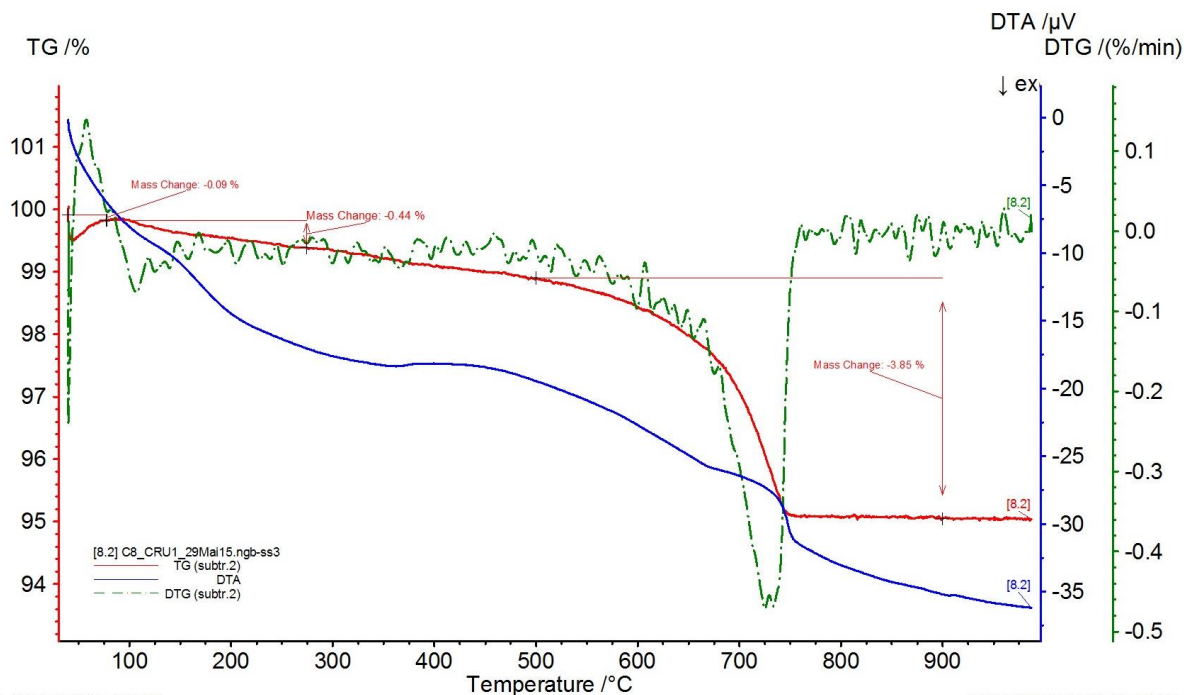


Composição mineralógica semi-quantitativa (% m/m)

Quartzo	Anortite	Diópsido	Gehlenite	Calcite	Andradite	Microclina
SiO <sub>2</sub>	CaAl <sub>2</sub> Si <sub>2</sub> O <sub>8</sub>	Ca(Mg,Al)(Si,Al) <sub>2</sub> O <sub>6</sub>	Ca <sub>2</sub> Al(AlSiO <sub>7</sub> )	CaCO <sub>3</sub>	Ca <sub>3</sub> Fe <sub>2</sub> (SiO <sub>4</sub> ) <sub>3</sub>	KAlSi <sub>3</sub> O <sub>8</sub>
22,21	26,52	17,81	7,04	5,10	0,95	20,37

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

## CHACOTA



Perda de massa (%)	Teor de carbonatos (%)
3,85	9

C8 2015-07-03 12:36 User: W7

total com brancosLurdes esteves.ngb-taa

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