

Introduction

January 2026 – ANSM Alert: Presence of an excipient with known effects in Tegretol® (Carbamazepine (CRBZ)) oral suspension → restriction on the user population → project to develop a hospital preparation

Objective

Development and validation of an HPLC-UV method for the quantification of CRBZ



Materials and methods



Chromatographic parameters

- Reverse-phase column Symetry Shield C18 5 µm (25°C)
- Flow rate : 1,2 ml/min of Méthanol/Eau (50/50, v/v)
- UV Detector : 285 nm
- Injection volume : 10 µL
- 7 point range (10 to 100 µg/mL) using a powder from the EDQM
- 3 points CQ in 3 point : 25-50-75 µg/mL using a powder from Thermofisher Scientific (≥ 98%)
- 3 different operators

Forced degradation

50 µL of CRBZ at 1 mg/mL	NaOH 2 M, 250 µL, 17h at 85°C	Neutralization and 1 mL QSP with mobile phase
	HCl 2 M, 250 µL, 17h at 85°C	Neutralization and 1 mL QSP with mobile phase
	H ₂ O ₂ 3%, 500 µL, 21h at 85°C	QSP 1mL with mobile phase
	UV, 17h at 25°C	QSP 1 mL with phase mobile

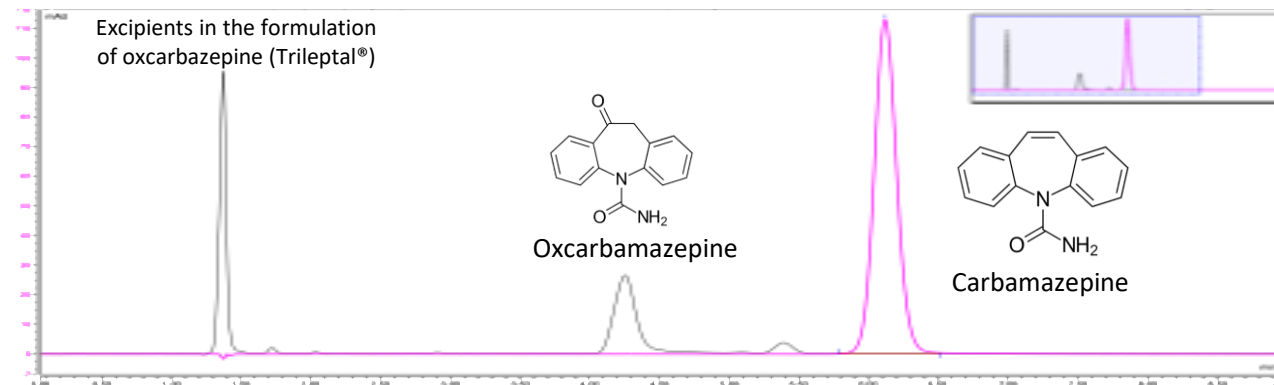


Discriminant analysis

- Oxcarbamazepine
- Impurity A in CRBZ (Pharmacopoeia)

Results

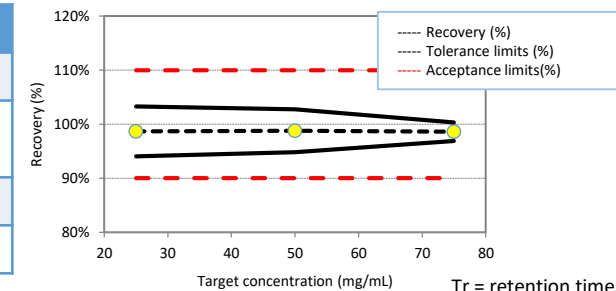
Chromatogram



Validation method

Parameters	Results
Linearity	$y = 0,8549x + 0,1162$ et $R^2 > 0,996$
Accuracy	Mean recovery = 98,7 % $IC_{95\%} = [98,2\% ; 99,3\%]$
Repetability	$CV \leq 0,2\%$
Intermediate fidelity	$CV \leq 1,0\%$

Accuracy profile



Forced degradation

	NaOH	HCl	H ₂ O ₂	UV
Degradation (% decrease in peak area)	- 29 %	- 69 %	- 8 %	0 %
Tr of degradation products	4,8 min ; 8,25 min	1,75 min ; 4,1 min ; 4,8 min ; 5,7 min ; 8,5 min	3,2 min	Aucun

Conclusion

HPLC-UV method developed and validated: linear, specific, accurate, and precise

Limits : The recovery rates obtained with the powder used for quality control have a systematic bias of -1.3%.

Perspectives : This analytical method is one of the first steps in the formulation of a liquid oral dosage form suitable for newborns.