

Health Sciences Authority (HSA)

Tender Analysis Report

- *for* -

ACQUITY H-Class UPLC System coupled with ACQUITY
Fluorescence Detector (FLD)

Date : 22 November 2017
Presented by : Waters Singapore Solution Centre
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Acquity
UPLC® CLASS

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Section 1 – Analysis Objectives

The main objective is to develop an instrument method for Aflatoxins B & G analysis with the following requirements:-

- maximum run time of 4 minutes;
- resolution between closest eluting peaks must be at least 2
- S/N of all analyte peaks must be greater than 3; and
- no any form of derivatization should be used.

Section 2 – Analysis Information

Name of Analyst : Chantel Lee

Date of Sample Collection : 10 November 2017

Date of Analysis : 21 November 2017

Section 3 – Sample Information

Sample	Description
A	Direct analysis
B	Diluted by 40 times with given diluents (10% MeOH in 1% Acetic Acid)

Section 4 – Instrument Parameters

LC Parameters

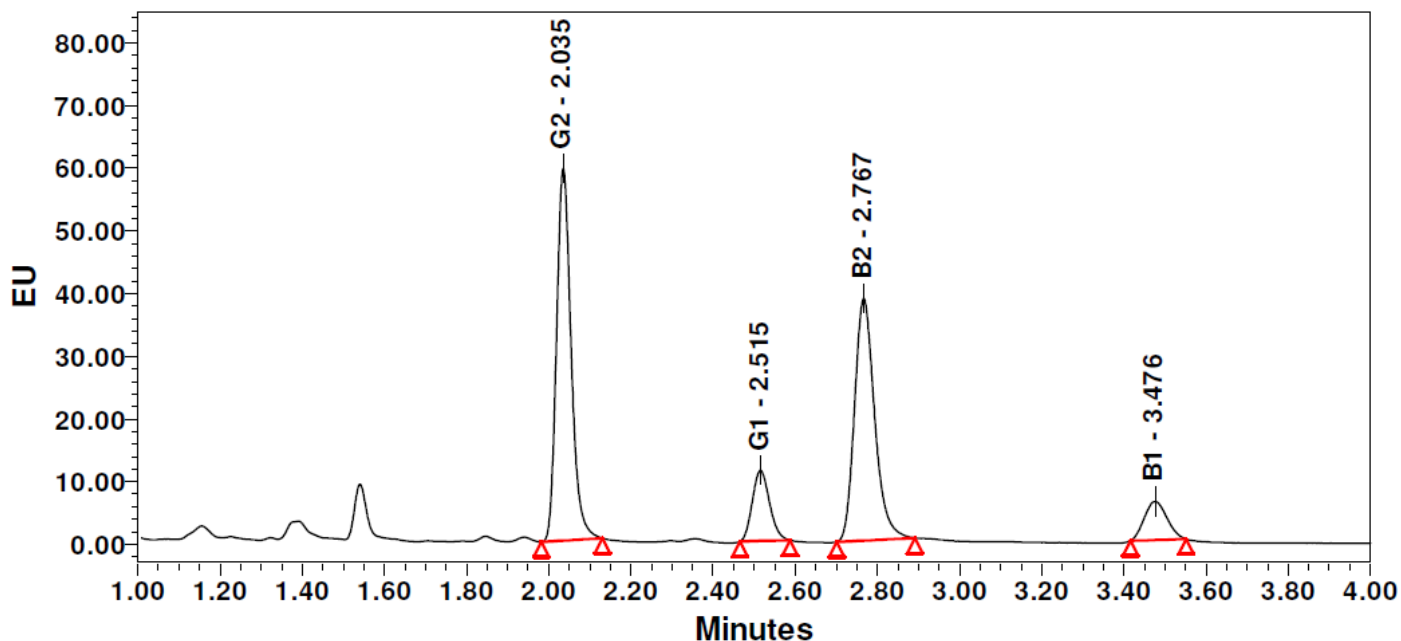
Parameters	Description
LC Instrument	ACQUITY H-Class UPLC (50uL Sample Loop)
Column	ACQUITY BEH C18, 2.1 x 100 mm, 1.7um
Run Time	5 min
Mobile Phase	A = Water B = Methanol C = Acetonitrile Isocratic Elution 64:18:18 A:B:C
Flow Rate	0.4 mL/min
Wash Solvent	50/50 Water/ACN
Purge Solvent	90/10 Water/Methanol
Column Temperature (°C)	30
Sample Temperature (°C)	4
Injection Volume (µL)	20

Detector Parameters

Parameters	Description
Detector	ACQUITY Fluorescence Detector (FLD) (Large Volume Flow Cell)
Excitation Channel	365 nm
Emission Channel	0.00 min – 456 nm 2.65 min – 429 nm
Sampling Rate	20 pts/sec
PMT Gain	10
Filter Time Constant	Normal

Section 5 – Results

Sample A

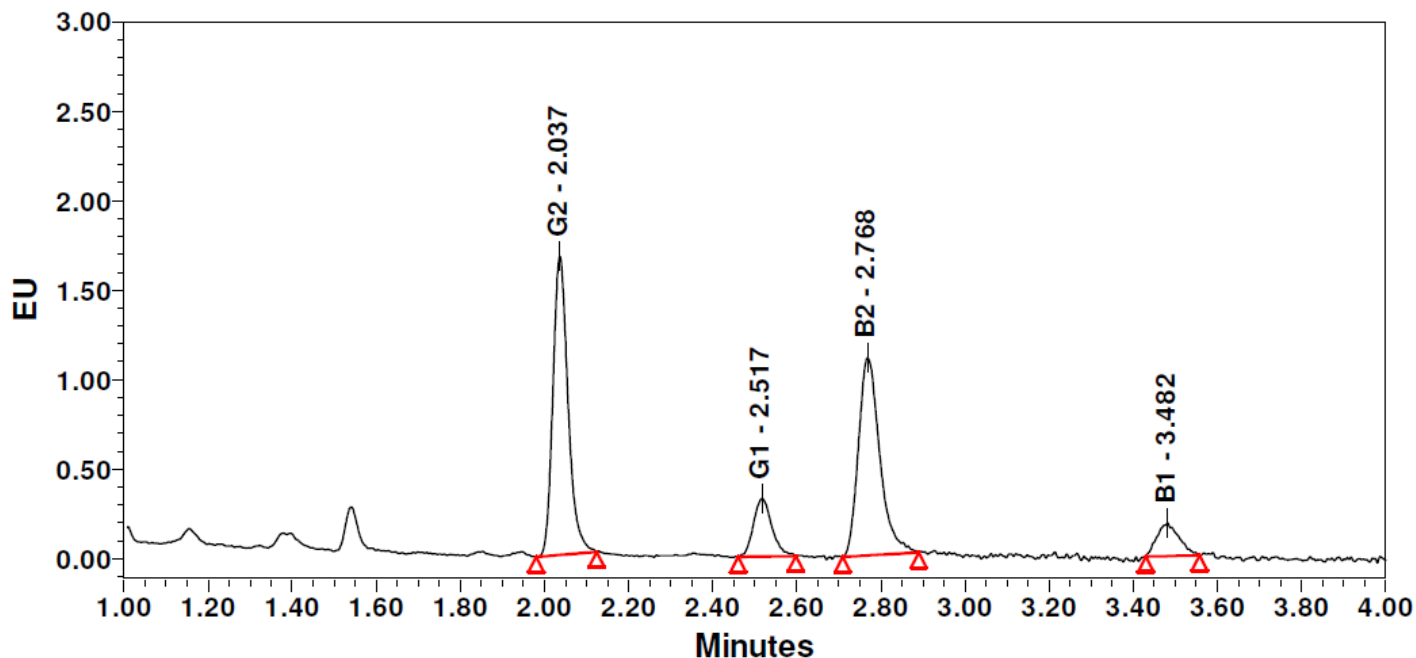


Aflatoxins	Retention Time (min)	Peak Area	Peak Height	Peak Width at Half Height (min)	S/N (USP)*	Resolution**
G2	2.035	1,461,039	593,540	0.037	8,454.30	-
G1	2.515	349,696	115,146	0.046	1,408.27	6.84
B2	2.767	1,320,105	386,537	0.051	1,297.01	3.04
B1	3.476	244,740	62,427	0.062	303.04	7.46

*S/N(USP) is auto-calculated by Empower using the formula: $\frac{S}{N} = 2 \times \left(\frac{\text{Height} - (0.5 \times \text{Noise}/\text{Scaling})}{\text{Noise}/\text{Scaling}} \right)$

** Resolution is calculated using the formula: $R_s = \frac{(t_2 - t_1) \times 1.18}{(w_{0.5h,1} + w_{0.5h,2})}$

Sample B



Aflatoxins	Retention Time (min)	Peak Area	Peak Height	Peak Width at Half Height (min)	S/N (USP)*	Resolution**
G2	2.037	41,763	16,678	0.038	235.80	-
G1	2.518	9,912	3,251	0.046	39.28	6.76
B2	2.768	39,040	11,038	0.053	36.10	2.98
B1	3.482	6,714	1,846	0.059	8.21	7.52

*S/N(USP) is auto-calculated by Empower using the formula: $\frac{S}{N} = 2 \times \left(\frac{\text{Height} - (0.5 \times \text{Noise}/\text{Scaling})}{\text{Noise}/\text{Scaling}} \right)$

** Resolution is calculated using the formula: $R_s = \frac{(t_2 - t_1) \times 1.18}{(w_{0.5h,1} + w_{0.5h,2})}$

Section 6 – Summary

- A UPLC-FLR method under 4 minutes was used to analyze 4 aflatoxins: B1, B2, G1 and G2.
- Baseline separation was achieved for all the 4 aflatoxins (resolution > 2.98).
- All the analyte peaks have S/N larger than 8.6.
- The ACQUITY H-Class UPLC system is capable of auto-blending up to four-solvents, avoiding the needs of solvent pre-mixing which can be prone to human error.
- The ACQUITY H-Class UPLC coupled with ACQUITY FLD using the large volume flow cell, provides the needed analysis sensitivity for the analysis of aflatoxins B and G without derivatization.