



TITLE

In House Laboratory Validation of Analytical Method for the Determination of Residues of BCS-CS55621, and Its Metabolites BCS-CY96288, BCS-CU97237, BCS-DA63612, BCS-CC26101, BCS-CZ38260, BCS-BP32808, and BCS-DH17585 in Soil and Sediment Using LC/MS/MS

- Final Report -

Test Substance

BCS-CS55621, and Its Metabolites BCS-CY96288, BCS-CU97237, BCS-DA63612, BCS-CC26101, BCS-CZ38260, BCS-BP32808, and BCS-DH17585

Data Requirement

US EPA Residue Chemistry Test Guidelines
OPPTS 860.1340 Residue Analytical Method

US EPA Ecological Effects Test Guidelines OCSPP 850.6100 Data Reporting for
Environmental Chemistry Methods

2.0 INTRODUCTION

The purpose of this study was to validate analytical method TY-003-S20-01 entitled "An Analytical Method for the Determination of Residues of BCS-CS55621, and Its Metabolites BCS-CY96288, BCS-CU97237, BCS-DA63612, BCS-CC26101, BCS-CZ38260, BCS-BP32808, and BCS-DH17585 in Soil and Sediment Using LC/MS/MS" [1].

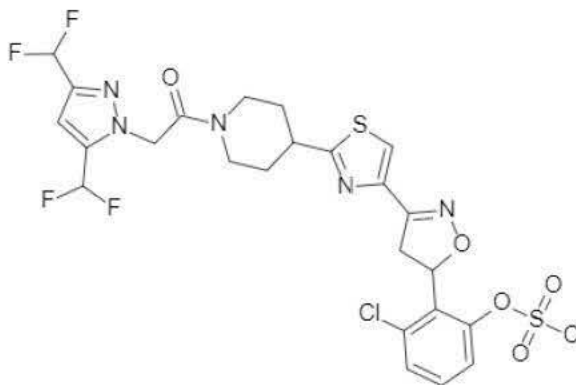
This study was conducted to satisfy guideline requirements described in the US EPA - Residue Chemistry Test Guidelines OPPTS 860.1340 [2], US EPA Ecological Effects Test Guidelines OCSP 850.6100 [3], PMRA: DACO 7.2.2 Residue Analytical Method [4] and Guidance document on residue analytical methods; SANCO/825/00 rev. 7 [5]. In addition, this study will be conducted in compliance with EPA FIFRA Good Laboratory Practice Standards, 40 CFR Part 160 [6].

3.0 MATERIALS AND METHODS

3.1 TEST ITEMS/REFERENCE SUBSTANCES

Only sufficiently characterized and certified substances were used as reference items.

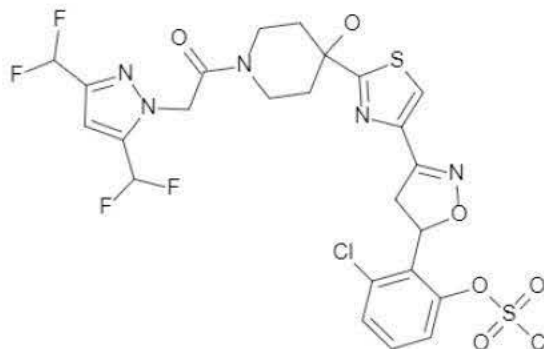
BCS-CS55621



Synonyms:	Fluoxapiprolin
IUPAC Name:	2-{3-[2-(1-[[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl] acetyl] piperidin-4-yl)-1,3-thiazol-4-yl]-4,5-dihydro-1,2-oxazol-5-yl}-3-chlorophenylmethanesulfonate
CAS Number:	1360819-11-9
Molecular Formula:	C ₂₅ H ₂₄ ClF ₄ N ₅ O ₅ S ₂
Molecular Weight:	650.06 g/mol
ID No.:	K-2231
Purity:	98.2%
Expiration Date:	01/02/2023
Storage Conditions:	Frozen

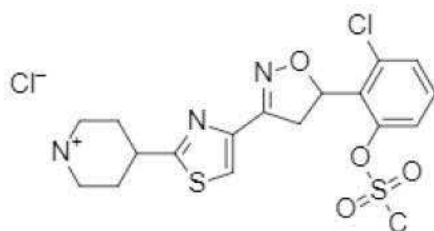


BCS-CY96288



IUPAC Name:	[2-[3-[2-[1-[2-[3,5-bis(difluoromethyl)pyrazol-1-yl]acetyl]-4-hydroxy-4-piperidyl]thiazol-4-yl]-4,5-dihydroisoxazol-5-yl]-3-chloro-phenyl] methanesulfonate
Molecular Formula:	C ₂₅ H ₂₄ ClF ₄ N ₅ O ₆ S ₂
Molecular Weight:	666.06 g/mol
ID No.:	K-2232
Purity:	97.4%
Expiration Date:	12/13/2020
Storage Conditions:	Frozen

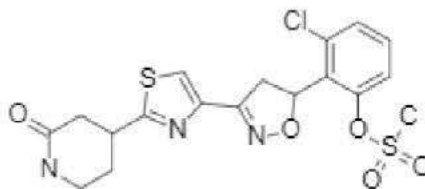
BCS- CU97237



IUPAC Name:	4-[4-(5-{2-chloro-6-[(methylsulfonyl)oxy]phenyl}-4,5-dihydro-1,2-oxazol-3-yl)-1,3-thiazol-2-yl]piperidinium chloride
Molecular Formula:	C ₁₈ H ₂₁ ClN ₃ O ₄ S ₂ · Cl
Molecular Weight:	478.41 g/mol
ID No.:	K-2261
Purity:	98.3%
Expiration Date:	08/20/2021
Storage Conditions:	Frozen

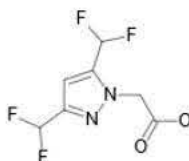


BCS-DA63612:



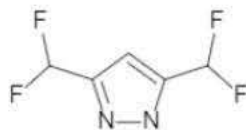
IUPAC Name:	3-chloro-2-{3-[2-(2-oxopiperidin-4-yl)-1,3-thiazol-4-yl]-4,5-dihydro-1,2-oxazol-5-yl}phenyl methanesulfonate
Molecular Formula:	C ₁₈ H ₁₈ ClN ₃ O ₅ S ₂
Molecular Weight:	455.94 g/mol
ID No.:	K-2279
Purity:	92.7%
Expiration Date:	04/08/2022
Storage Conditions:	Frozen

BCS-CC26101:



IUPAC Name:	2-[3,5-bis(difluoromethyl)pyrazol-1-yl]acetic acid
Molecular Formula:	C ₇ H ₆ F ₄ N ₂ O ₂
Molecular Weight:	226.13 g/mol
ID No.:	K-2234
Purity:	98.5%
Expiration Date:	08/26/2024
Storage Conditions:	Frozen

BCS-BP32808:



IUPAC Name:	3,5-bis(difluoromethyl)-1H-pyrazole
Molecular Formula:	C ₅ H ₄ F ₄ N ₂
Molecular Weight:	168.09 g/mol
ID No.:	K-2301
Purity:	98.2%
Expiration Date:	01/22/2021
Storage Conditions:	Frozen

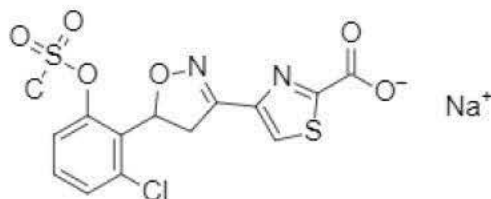


BCS-CZ38260:



IUPAC Name:	5-(difluoromethyl)-1H-pyrazole-3-carboxylic acid
Molecular Formula:	C ₅ H ₄ F ₂ N ₂ O ₂
Molecular Weight:	162.09 g/mol
ID No.:	K-2233
Purity:	99.8%
Expiration Date:	12/04/2020
Storage Conditions:	Frozen

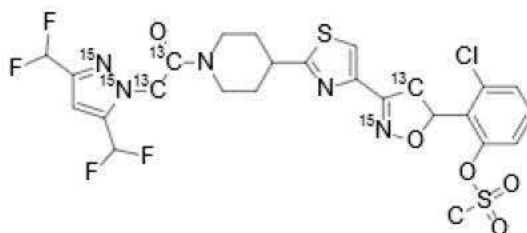
BCS-DH17585:



IUPAC Name:	Sodium 4-[5-(2-chloro-6-methylsulfonyloxy-phenyl)-4,5-dihydroisoxazol-3-yl]thiazole-2-carboxylate
Molecular Formula:	C ₁₄ H ₁₀ ClN ₂ O ₆ S ₂ Na
Molecular Weight:	424.81 g/mol
ID No.:	K-2323
Purity:	90.8%
Expiration Date:	11/29/2020
Storage Conditions:	Frozen

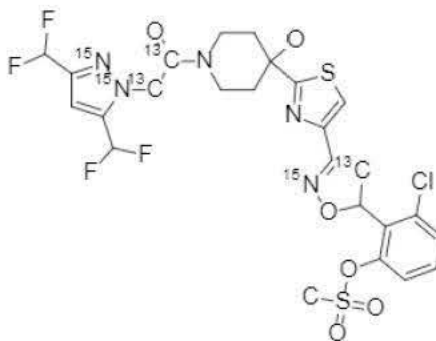
3.2 INTERNAL STANDARDS

BCS-CS55621-¹³C₃, ¹⁵N₃



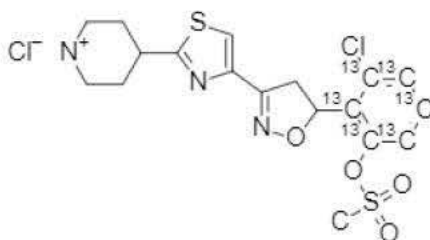
Molecular Formula:	¹³ C ₃ C ₂₂ H ₂₄ ClF ₄ ¹⁵ N ₃ N ₂ O ₅ S ₂
Molecular Weight:	656.02 g/mol
ID No.:	K-2246
Purity:	100.0%
Expiration Date:	04/05/2027
Storage Conditions:	Frozen

BCS- CY96288-¹³C₃, ¹⁵N₃



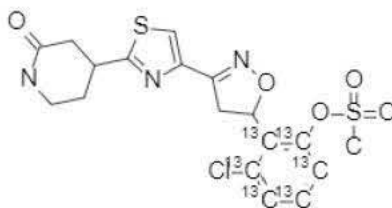
Molecular Formula:	¹³ C ₃ C ₂₂ H ₂₄ ClF ₄ ¹⁵ N ₃ N ₂ O ₆ S ₂
Molecular Weight:	672.02 g/mol
ID No.:	K-2315
Purity:	98.9%
Expiration Date:	12/05/2028
Storage Conditions:	Frozen

BCS-CU97237-¹³C₆:



Molecular Formula:	¹³ C ₆ C ₁₂ H ₂₁ ClN ₃ O ₄ S ₂ .Cl
Molecular Weight:	484.37 g/mol
ID No.:	K-2317
Purity:	99.2%
Expiration Date:	12/05/2028
Storage Conditions:	Frozen

BCS-DA63612-¹³C₆:



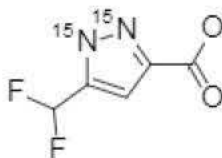
Molecular Formula:	¹³ C ₆ C ₁₂ H ₁₈ ClN ₃ O ₅ S ₂
Molecular Weight:	461.89 g/mol
ID No.:	K-2318
Purity:	99.3%
Expiration Date:	12/05/2028
Storage Conditions:	Frozen

BCS-CC26101-¹³C₂:



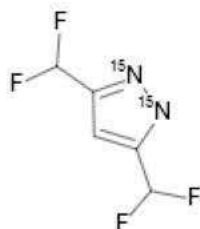
Molecular Formula:	¹³ C ₂ C ₅ H ₆ F ₄ N ₂ O ₂
Molecular Weight:	228.11 g/mol
ID No.:	K-2306
Purity:	100%
Expiration Date:	09/04/2028
Storage Conditions:	Frozen

BCS CZ38260-¹⁵N₂:



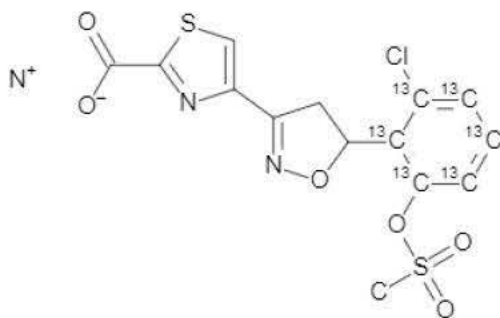
Molecular Formula:	C ₅ H ₄ F ₂ ¹⁵ N ₂ O ₂
Molecular Weight:	164.08 g/mol
ID No.:	K-2316
Purity:	100%
Expiration Date:	12/05/2028
Storage Conditions:	Frozen

BCS-BP32808-¹⁵N₂:



Molecular Formula:	C ₅ H ₄ F ₄ ¹⁵ N ₂
Molecular Weight:	170.08 g/mol
ID No.:	K-2305
Purity:	99.6%
Expiration Date:	10/10/2020
Storage Conditions:	Frozen

BCS-DH34157-¹³C₆:



Molecular Formula:	¹³ C ₆ C ₈ H ₁₀ ClN ₂ O ₆ S ₂ ·H ₄ N
Molecular Weight:	425.82 g/mol
ID No.:	K-2332
Purity:	100%
Expiration Date:	09/12/2029
Storage Conditions:	Frozen

Characterization data for the reference substances (analytical standards) and internal standards are maintained by Bayer CropScience.

The test/reference substances (analytical standards) and internal standard used in this study were procured from Bayer CropScience and stored as directed on "Analytical Standards Chain of Custody" and "Certificate of Analysis" documents. All solutions made from the reference substances (analytical standards) were stored according to the method.



3.3 TEST SYSTEMS

The analytical method TY-003-S20-01 was evaluated in two different soils and one sediment sample all of which originated in the United States. The two soils were collected as sub-samples of bulk untreated sample (Sample ID: N19SD001-01-W-0001F-0002F-003) from soil dissipation study METY0051 (California) and untreated sample (Sample ID: N19SD004-01-W-0001 2 3F) from study METY0057 (Iowa). The sediment was collected from Brandywine Creek at Chadds Ford, PA on Nov. 8, 2017. The samples were classified according to USDA specifications and the characteristics are summarized below:

Description	California Soil (Study METY0051)	Iowa Soil (Study METY0057)	Pennsylvania Sediment
pH (CaCl ₂ solution)	6.9	7.0	4.3
pH (aqueous solution)	7.5	7.5	4.5
Organic carbon (%) ^a	0.29	2.0	7.9
Organic matter (%)	0.50	3.5	13.3
Cation Exchange Capacity (CEC) (meq/100 g)	6.6	21.4	11.8
Maximum water holding capacity (g water/100 g dry soil)	NR	NR	114.0
USDA Textural Description- Hydrometer method (Fraction %)			
Clay (<0.002 mm)	4	34	27.5
Silt (0.002 – 0.050 mm)	15	58	64.5
Sand (0.050 - 2.000 mm)	81	8	8
Soil/sediment type	Loamy Sand	Silty Clay Loam	Silty Clay Loam

^a Organic carbon = Organic matter ÷ 1.72
NR = Not reported

3.4 SAMPLE PREPARATION AND EXTRACTION

Bayer analytical method TY-003-S20-01 was used for the analysis of BCS-CS55621, and its metabolites BCS-CY96288, BCS-CU97237, BCS-DA63612, BCS-CC26101, BCS-CZ38260, BCS-BP32808, and BCS-DH17585 in soil and sediment. Soil and sediment samples were prepared as follows:

Residues of BCS-CS55621 and its metabolites are extracted in a microwave extractor from soil and sediment using a mixture of 4:1 (v/v) acetonitrile/water. Isotopic internal standards are added to the sample. A sample aliquot was centrifuged and the supernatant was concentrated and analyzed for BCS-CS55621, and its metabolites BCS-CY96288, BCS-CU97237, BCS-DA63612, BCS-CC26101, BCS-CZ38260, BCS-BP32808, and BCS-



DH17585 by LC/MS/MS. Quantification is based on a comparison of peak areas with those of known standards.

Two product ions per analyte were selected for monitoring; one ion mass transition served as quantitation and the other ion mass transition was used for confirmation. The mass transitions for both the quantitation as well as the confirmation for all substances are presented below:

Analyte	Quantitation MRM ^a	Confirmation MRM ^a
BCS-CS55621	650→610.2	650→378
BCS-CY96288	666→626.1	666→191
BCS-CU97237	442.2→332	442.2→208
BCS-DA63612	456→345.2	456→222.1
BCS-CC26101	225→161	225→141
BCS-CZ38260	161→76	163→77
BCS-BP32808	169→101	169→149
BCS-DH17585	403→169	403→157

^a All masses reported in amu.

3.5 INSTRUMENTATION

Standard Method for all Analytes

The HPLC conditions employed were as follows:

Mobile Phase A: 0.5% Acetic Acid in water

Mobile Phase B: 0.5% Acetic acid in Acetonitrile

Mobile Phase C: 0.1% Formic acid in Acetonitrile

Oven: 40 °C

Pre column (optional): SecurityGuard ULTRA UHPLC C8

HPLC Column: YMC-UltraHT Hydrosphere 2.0 µm, 12 nm, 30 x 2.00 mm i.d.

Injection Volume: 20 µL (adjust as needed)

Pumping mode: Binary Flow

Binary flow rate: 0.80 mL/min



Gradient and flow rate:

Time (min)	Module	Events	Parameters
0.0	Pumps	Pump C Flow	0
0.0	Pumps	Pump B Conc	5
0.10	Pumps	Pump B Conc	5
0.70	Pumps	Pump B Conc	90
1.20	Pumps	Total Flow	0.5
1.30	Pumps	Pump C Flow	0
1.40	Pumps	Pump C Flow	0.4
2.00	Pumps	Pump C Flow	0.4
2.10	Pumps	Total Flow	0.5
2.10	Pumps	Pump C Flow	0
2.20	Pumps	Total Flow	0.8
4.00	Pumps	Pump B Conc	90
4.10	Pumps	Pump B Conc	5
5.00	Controller	Stop	

Divert Valve: Programmed to divert LC flow from column to waste (bypassing detector) from 0 to 0.5 minutes and again from 2.5 to end. LC flow is directed to detector during the 0.5 to 2.5 minute window.

Column Temperature: 40 °C

Injection Volume: 20 µL

The MS/MS conditions employed were as follows:

The detection by MS/MS was performed on a triple-quadrupole tandem mass spectrometer, equipped with a Turbo IonSpray (ESI) interface operated in multiple reaction monitoring (MRM) with unit mass resolution.

Curtain Gas (CUR)	55
Collision Gas (CAD)	8
Ion Source Gas 1 (GS1)	55
Ion Source Gas 2 (GS2)	55
Source Temp. (TEM)	600
Ion Transfer Voltage (IS+)	5500
Ion Transfer Voltage (IS-)	-4500

MS/MS Parameters for the determination and confirmation of BCS-CS55621, and its metabolites BCS-CY96288, BCS-CU97237, BCS-DA63612, BCS CC26101, BCS-CZ38260, BCS-BP32808, and BCS-DH17585 were as follows:



Analyte Name	Polarity	Q1 Mass (amu)	Q3 Mass (amu)	DP	EP	CE	CXP	Retention Time (min)
BCS-CS55621-Q	+	650	610.2	30	10	41	9	~1.27
BCS-CS55621-C	+	650	378	30	10	46	9	~1.27
BCS-CS55621-IS	+	656	616.2	30	10	41	9	~1.27
BCS-CY96288-Q	+	666	626.1	30	10	28	9	~1.22
BCS-CY96288-C	+	666	191	30	10	46	9	~1.22
BCS-CS55621-IS	+	672	634.1	30	10	28	9	~1.22
BCS-CU97237-Q	+	442.2	332	30	10	38	9	~0.86
BCS-CU97237-C	+	442.2	208	30	10	38	9	~0.86
BCS-CU97237-IS	+	448	338	30	10	38	9	~0.86
BCS-DA63612-Q	+	456	345.2	30	10	50	9	~1.06
BCS-DA63612-C	+	456	222.1	30	10	37	9	~1.06
BCS-DA63612-IS	+	462	351	30	10	50	9	~1.06
BCS-CC26101-Q	-	225	161	-30	-10	-35	-9	~1.13
BCS-CC26101-C	-	225	141	-30	-10	-42	-9	~1.13
BCS-CC26101-IS	-	227	162	-30	-10	-35	-9	~1.13
BCS-CZ38260-Q	-	161	76	-30	-10	-21	-9	~0.84
BCS-CZ38260-IS-Q	-	163	77	-30	-10	-21	-9	~0.84
BCS-CZ38260-C	+	163.1	125	30	10	28	9	~0.84
BCS-CZ38260-IS-C	+	165	127	30	10	28	9	~0.84
BCS-BP32808-Q	+	169	101	30	10	37	9	~1.00
BCS-BP32808-C	+	169	149	30	10	27	9	~1.00
BCS-BP32808-IS	+	171	101	30	10	37	9	~1.00
BCS-DH17585-Q	+	403	169	30	10	27	9	~1.90
BCS-DH17585-C	+	403	157	30	10	37	9	~1.90
BCS-DH17585-IS	+	409	169	30	10	27	9	~1.90

Example LC/MS/MS conditions are presented in [Appendix 4](#).



3.6 CALCULATIONS

The example calculation displayed below was used by the laboratory developing this method. Alternate calculation procedures appropriate to the reporting requirements may be substituted.

Residue concentrations were determined using calibration curves which were generated after each analysis using Analyst Software (ver. 1.7.1) using linear regression with 1/x weighting.

The standards were fit to the linear equation: $Y = MX + B$

where: X is the concentration of the reference standard in ng/g
M is the calibration line slope
B is the calibration line intercept
Y is the native peak area: isotopic peak area ratio

The example shown below (Sample No. 19FL-CA-SLLOQ-001) is for the calculation of BCS-CS55621-Q residues. All the other analytes' residues are calculated in a similar fashion.

After regression coefficients were calculated, the residue in ng/g was determined. The ng/g of BCS-CS55621-Q in soil was calculated using the following equation,

$$\text{Residue (ppb)} = \frac{(Y - B)}{M}$$

Native Peak Area	IS Peak Area	Y	M	B
224,127	1,685,126	0.133	0.259	-0.002651

The slope and intercept were obtained from the calibration curve generated by Analyst 1.7.1, and example is presented in [Appendix 3](#). The calibration points were weighted 1/x to provide better fit near the limit of detection

From the above equations:

$$\text{BCS-CS55621-Q Residue} = \frac{(0.133 + 0.002651)}{0.259} = 0.52 \text{ ng/g}$$

Therefore, sample 19FL-CA-SLLOQ-001 contains 0.52 ng/g BCS-CS55621. This result, using rounded numbers, agrees with the result shown in the raw data.



The percent recovery was calculated as follows:

$$\text{Recovery (\%)} = \frac{(R - S)}{T} \times 100$$

Where: R = ng/g of target analyte found in fortified (recovery) sample
S = ng/g of target analyte found in control sample, real or apparent
T = theoretical ng/g in fortified sample

Therefore, for sample 18DC-GA-SLLOQ-001,

$$\begin{aligned} R &= 0.52 \text{ ng/g} \\ S &= 0.0 \text{ ng/g} \\ T &= 0.5 \text{ ng/g} \end{aligned}$$

$$\% \text{ Recovery} = \frac{(0.52 - 0.0)}{0.5} \times 100 = \quad \%$$

Remark: Example calculations shown above were performed using the LC/MS/MS software Analyst 1.7.1. The example calculation was performed using the area values reported by the instrument. The instrument software carries additional figures not shown in the intermediate results. Therefore, instrument software calculated values will differ slightly from the results derived using a calculator.

4.0 RESULTS AND DISCUSSION

4.1 Selectivity

Separation of analytes by HPLC followed by detection using tandem MS/MS resulted in high selectivity for the method.

4.2 Linearity

The correlation between the injected amount of substance and the detector response was linear for standards ranging from 0.25 ng/mL to 50 ng/mL, with correlation coefficients of >0.99 for all samples for all test items.

4.3 Untreated Control Samples

No apparent residues of BCS-CS55621, and its metabolites BCS-CY96288, BCS-CU97237, BCS-DA63612, BCS-CC26101, BCS-CZ38260, BCS-BP32808, and BCS-DH17585 were detected in untreated control samples of soil and sediment samples.

4.5 Method Limit of Detection (LOD)

An estimate of the potential LOD was determined by examining the variability in the recovery as measured by the standard deviation of the amount found at the target LOQ (0.5 ng/g) fortification.

The estimated potential method detection limit for each analyte was calculated using the equation shown below.

$$\text{LOD (calculated)} = (\text{standard deviation} \times t_{0.99})$$

Where $t_{0.99}$ = one-tailed t-statistic at the 99% confidence level for n-1 replicates.

As fourteen replicate analyses were performed during the method verification for soil, from the Student t-tables, $t_{0.99} = 2.650$.

Seven replicate analyses were performed during the method verification for sediment, from the Student t-tables, $t_{0.99} = 3.143$.

The calculated LOD's (ng/g) from the quantitation ion transition for BCS-CS55621, and its metabolites BCS-CY96288, BCS-CU97237, BCS-DA63612, BCS-CC26101, BCS-CZ38260, BCS-BP32808, and BCS-DH17585 determined during the method validation study in soil samples were found to range between 0.04 to 0.11 ng/g as presented in [Table 17](#).

Analyte	LOQ (ng/g)	LOD (ng/g)
BCS-CS55621	0.50	0.10
BCS-CY96288	0.50	0.11
BCS-CU97237	0.50	0.07
BCS-DA63612	0.50	0.06
BCS-CC26101	0.50	0.04
BCS-CZ38260	0.50	0.09
BCS-BP32808	0.50	0.07
BCS-DH17585	0.50	0.08

The calculated LOD's (ng/g) for BCS-CS55621, and its metabolites BCS-CY96288, BCS-CU97237, BCS-DA63612, BCS-CC26101, BCS-CZ38260, BCS-BP32808, and BCS-DH17585 determined during the method validation study in sediment sample were found to range between 0.04 to 0.19 ng/g as presented in [Table 18](#).

Analyte	LOQ (ng/g)	LOD (ng/g)
BCS-CS55621	0.50	0.10
BCS-CY96288	0.50	0.19
BCS-CU97237	0.50	0.05
BCS-DA63612	0.50	0.04
BCS-CC26101	0.50	0.04
BCS-CZ38260	0.50	0.05
BCS-BP32808	0.50	0.06
BCS-DH17585	0.50	0.09



4.6 STABILITY OF THE FINAL SAMPLE EXTRACT

The stability of the analytes in the final soil sample extract for the quantitative analytes of BCS-BP32808 and BCS-DH17585 was assessed by re-analyzing the control and 10x LOQ samples using the quantitation method 10 days after the samples were initially prepared. Between the 0 and 10 day analysis the samples were refrigerated at an average temperature of 3.5°C.

The final sample extracts have degraded by less than 15% from the initial analysis then the solutions are deemed to be stable for the specified time period as presented in [Table 19](#). The sample extracts are stable for a minimum of 10 days.

4.7 STABILITY IN STANDARD SOLUTIONS

The stabilities of primary stock solutions for BCS CS55621, and its metabolites BCS-CY96288, BCS-CU97237, BCS-DA63612, BCS CC26101, BCS-CZ38260, BCS-BP32808, and BCS-DH17585 were tested for 171 days at <-18°C storage in the freezer. Secondary standard solutions in Acetonitrile/water 4/1 were tested over a period of 123 days when stored refrigerated at ≤10°C. Calibration standard solution in Acetonitrile/water in 1/9 were tested over a period of 122 days when stored refrigerated at ≤10°C.

The storage stability test was performed by diluting the stored and freshly prepared primary standard solutions to the same concentration as the secondary standard solutions. Then the secondary solutions were compared by mixing internal standards and diluting to LC/MS/MS injectable concentration. The diluted samples with IS were each injected to LC/MS/MS in 5 replicates. The peak area ratio of each analytes was compared.

One level of stored and freshly prepared calibration standard solution was injected to LC/MS/MS in 5 replicates. The peak area ratio of each analyte was compared.

The average peak area ratio of the stored solutions are all within ±15% of the freshly prepared solution for the stability to be considered successful as presented in [Table 20](#).

4.8 Time requirements

A single analyst completed sample sets consisting of 15 samples in two to three hours with HPLC-MS/MS analysis performed overnight.

4.9 Protocol/SOP/Method Deviations

No protocol deviation was generated during the study.

5.0 CONCLUSION

Bayer CropScience in the U.S. successfully independently validated Bayer CropScience analytical method "An Analytical Method for the Determination of Residues of BCS-CS55621, and Its Metabolites BCS-CY96288, BCS-CU97237, BCS-DA63612, BCS-CC26101, BCS-CZ38260, BCS-BP32808, and BCS-DH17585 in Soil and Sediment Using LC/MS/MS "[1]. The method was validated on the first validation sets.



The method was demonstrated to be suitable for the determination of all targeted analytes in two separate soils collected from sites in California (CA), Iowa (IA) and one sediment sample from Pennsylvania (PA). A LOQ of 0.5 ng/g was demonstrated for each analyte in each matrix evaluated. The blank values in all control samples were below 30% of LOQ, demonstrating that no background level of BCS-CS55621, BCS-CY96288, BCS-CU97237, BCS-DA63612, BCS-CC26101, BCS-CZ38260, BCS-BP32808, and BCS-DH17585 for all MRM transitions were present in the test systems.