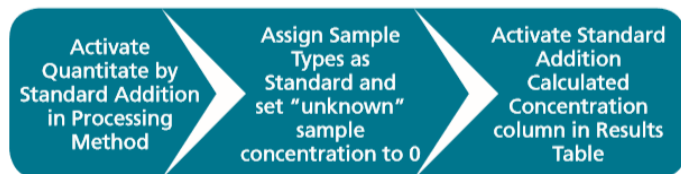# Technology

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Standard Addition Processing Simplified with SCIEX OS Software

Streamline Data Processing for Samples that Require Quantitation with Standard Addition Technique

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What: Standard addition is an analytical technique that allows the user to quantitate analytes in complex samples with high background or when surrogate standards are not readily available. The matrix with a background concentration of the target analyte is spiked with increasing amounts of known standard of that analyte and the subsequent standard addition curve and the response factor are used to extrapolate an unknown concentration in the original sample. MultiQuant™ Software is currently unable to perform this technique natively inside the software. It must be accomplished using a query architecture, which can be time consuming and prone to human error.

How: In this example of pond water screening, background levels of ciprofloxacin were observed in the sample matrix. First, a standard curve was prepared by spiking increasing amounts of known standard of the analyte into the sample matrix. By activating the standard addition feature in the processing method, the background level was easily calculated, and the calibration curve plotted. To do this you have to:

- Set Sample Type to Standard for all samples including the Blank samples whose concentration is to be calculated.

- For the Blank sample, 0 is set in the Actual Concentration column.

- For the spiked matrix solutions, the actual concentration spiked into to the samples is set in the Actual Concentration column.

- The column "Standard Addition Calculated Concentration" was activated in the Results Table to show the calculated

concentration of the endogenous level of ciprofloxacin in the Blank samples (Figure 1)

- Results are dynamically updated when any changes are made to the Results Table.

One of the critical requirements of standard addition is ensuring the correct amount of analyte is spiked in to the matrix aliquots to allow extrapolation back to the background level in the blank matrix. The standard addition feature addresses this issue by plotting a calibration curve of the Added Concentration on the x-axis (Figure 2) and a dotted line indicating the background level in the sample matrix.

Sample Name	Sample ID	Sample Type	Actual Concentra...	Calculated Concentrat...	Accuracy	Std Addition Calculated Concentration
1 ppb_Pond	s1	Standard	1.00	1.03	102.58	7.42
2 ppb_Pond	s1	Standard	2.00	2.05	102.51	7.42
5 ppb_Pond	s1	Standard	5.00	5.10	101.99	7.42
10 ppb_Pond	s1	Standard	10.00	10.98	109.77	7.42
20 ppb_Pond	s1	Standard	20.00	20.68	103.39	7.42
50 ppb_Pond	s1	Standard	50.00	49.52	99.04	7.42
Pond Blank	s1	Standard	0.00	< 0	N/A	7.42

Figure 1. Results Table. Standard Addition Calculation Concentration column showing the background concentration of the target analyte in the pond water matrix.
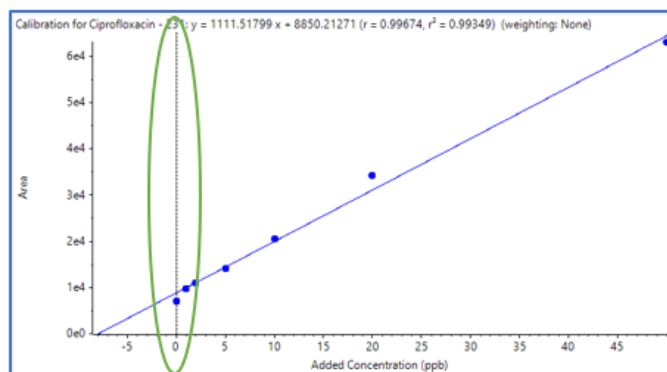

Figure 2. Standard addition calibration curve in pond water matrix.