

UPLC AMINO ACID ANALYSIS SOLUTION

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- ACQUITY UPLC® System with the ACQUITY UPLC TUV Detector
- AccQ•Tag™ Ultra derivatization and separation chemistries including quality-control tested columns, reagents, and eluents
- Empower™ 2 Software pre-configured projects, methods and report formats
- Connections INSIGHT® Intelligent Service Delivery Platform (ISDP)
- Application-specific performance qualification
- Full system- and application-level support and documentation

THE RIGHT ANSWER FOR AMINO ACID ANALYSIS

Resolution, sensitivity, or throughput – you no longer have to choose just one. Traditional chromatographic techniques for analyzing amino acids require scientists to make significant compromises depending on your analytical priorities.

With the introduction of enabling technologies such as Waters® UltraPerformance LC®, scientists can now achieve greater resolution, sensitivity, accuracy, and productivity than ever before – without compromise – because Waters recognizes that you should not have to make trade-offs in order to achieve optimal analytical results.

To meet the specific and rigorous demands of analyzing amino acids for protein characterization, cell culture monitoring, and nutritional analysis of foods and feeds, Waters has created a complete application system: the UPLC® Amino Acid Analysis Solution, part of the Waters Assured Performance Solution (APS) family.



ASSURED PERFORMANCE SOLUTIONS

Waters Assured Performance Solutions (APS) form a family of systems that bring together industry-leading technologies – instrumentation, chemistries, software, qualification tools, and services – that are specifically optimized for exceptional, application-focused performance. Designed by scientists for scientists, these solutions remove the guesswork in choosing the best solution for your application's needs.

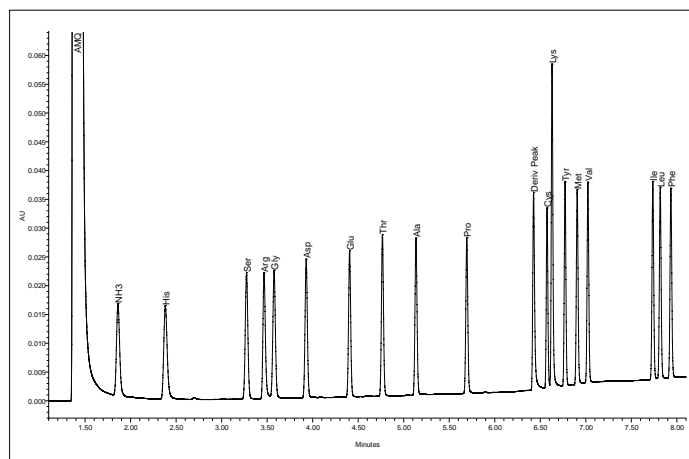
Whether you work in pharmaceuticals, proteomics, chemical analysis, or beyond, with Waters APS, you can be assured that whenever a new application challenge arises, Waters will have the technology and expertise to help you conquer it.

ENABLING YOUR SUCCESS WITH PROVEN INNOVATIONS

The Waters UPLC Amino Acid Analysis (AAA) Solution is the product of more than 25 years' experience designing instruments, chemistries, and methods for amino acids, highlighted by the development and widespread success of our proven Pico•Tag® and AccQ•Tag chemistries. Today, Waters continues to lead the way in separations sciences by bringing together our most ground-breaking and popular technologies: the ACQUITY UPLC System and AccQ•Tag Ultra, the newest addition to the AccQ•Tag family of products.

The UPLC Amino Acid Analysis Solution is holistically designed and optimized for analyzing amino acids. Derivatized amino acids are separated using the powerful ACQUITY UPLC System, which delivers enhanced chromatographic resolution to ensure accurate and precise qualitative and quantitative results. Just as important, our system solution includes rugged and reliable performance-qualified methodologies that assure you'll get accurate results day-to-day, instrument-to-instrument, lab-to-lab, around the world. And you can always rely on the expert applications support that scientists have come to expect from Waters.

UPLC resolution: Analysis of a hydrolysate standard at 10 pmol/μL



The UPLC Amino Acid Analysis Solution provides high resolution to ensure method robustness with good quantitation. The short cycle time is obtained without compromising accurate results.

Intelligently designed

The UPLC Amino Acid Analysis Solution leverages the best of Waters' expertise in separation science, derivatization chemistries, and information management. Your lab will reap benefits from uncompromised chromatographic performance, accuracy, reliability, and reproducibility that cannot be found in any other system on the market today.

ACQUITY UPLC System

The ACQUITY UPLC System, engineered from the ground up with robust hardware to meet the demands of our unique sub-2 μm small-particle chemistries, is the highest performance LC system available. Its novel design accommodates pressure-tolerant particles and fluidic modules, minimized system volume, negligible carryover, and reduced cycle times. The system is rounded out with fast-response detectors, integrated system software and Connections INSIGHT ISDP instrument diagnostics to ensure continuous, consistent, and reliable operation in your lab.

AccQ•Tag Ultra Chemistry

AccQ•Tag Ultra Chemistries are a comprehensive and fully-tested set of reagents, columns and eluents optimized for use with the ACQUITY UPLC System. This chemistry is based on Waters' widely-used and understood AccQ•Tag derivatization method. High resolution separations are achieved using pre-qualified AccQ•Tag Ultra UPLC columns and mobile phases. Derivatized amino acids are quantified to sub-picomole levels with single wavelength UV detection.

Performance qualification

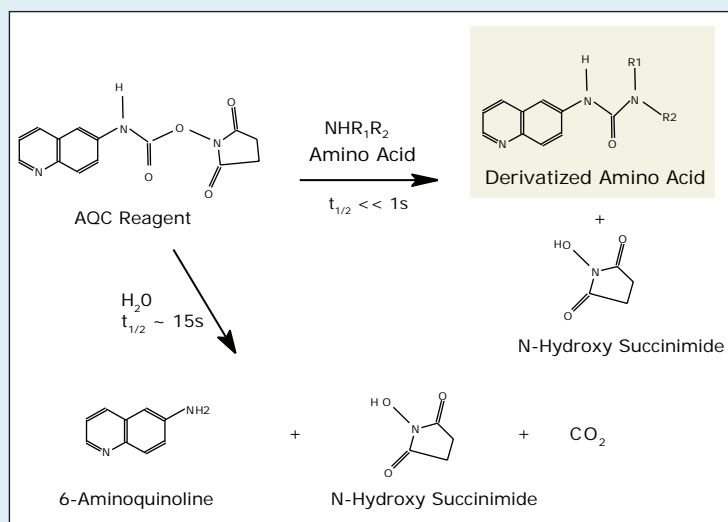
Qualification services available for the UPLC Amino Acid Analysis Solution meet the most stringent regulatory requirements. Installation, Operation, and Performance Qualification (IQ/OQ/PQ) protocols ensure that every element of the system is performing according to its intended use. An additional PQ, specific for amino acid analysis, is also available to verify performance and ensure accurate results.

Detection choices

You can analyze all the amino acids at the maximum sensitivity using the ACQUITY UPLC TUV Detector. If you also use the system for other applications, you can choose an FLR or PDA detector.

Derivatization with AccQ•Tag Ultra Chemistry

The AccQ•Tag Ultra reagent, or ACQ, is an N-hydroxysuccinimide-activated heterocyclic carbamate. This reagent converts both primary and secondary amino acids in a high-throughput batch process resulting in exceptionally stable derivatives. The resulting derivatives are stable at room temperature for up to one week. All components of AccQ•Tag Ultra chemistry, including the columns, derivatization kits, and mobile phases, undergo strict QC testing.



PERFORMANCE THAT EXCEEDS EXPECTATIONS

Powered by the ACQUITY UPLC System, our Assured Performance Solution for amino acid analysis delivers uncompromised resolution, sensitivity, and throughput in a robust, reliable method.

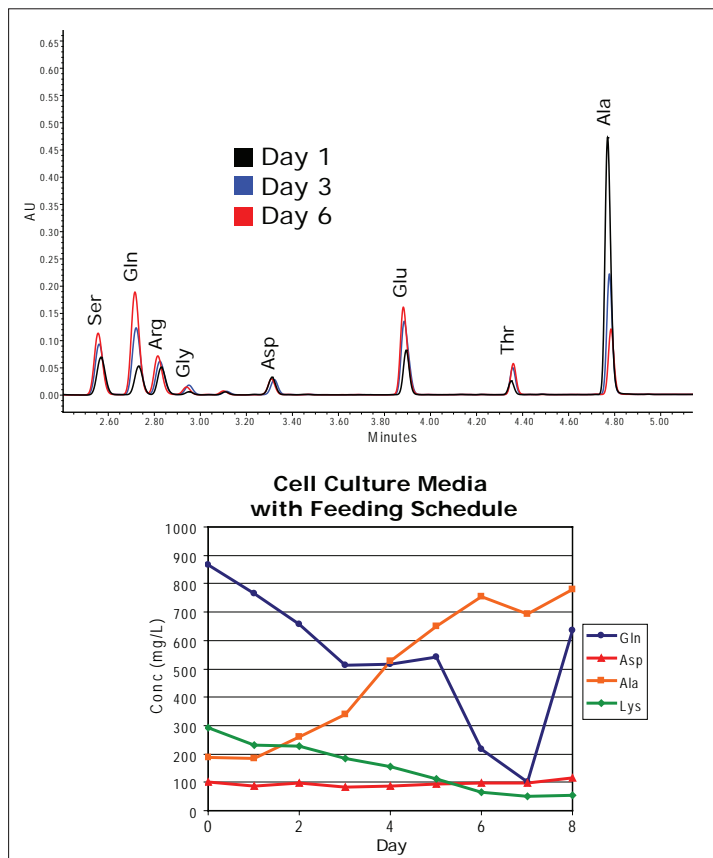
Method robustness that minimizes variability

The UPLC Amino Acid Analysis Solution provides you with control over the major factors that commonly cause variability in amino acid analysis. From optimized instrumentation and quality controlled chemistries to standardized Empower Software projects and qualification tools, you will rely on a method that is both rugged and reliable – a comprehensive and detailed approach that ensures successful analysis of every sample.

Better resolution translates to accurate results

Sub-2 μm particle UPLC technology delivers the greatest available column efficiency and resolution. With the system's superior resolution of all amino acids, you will confidently achieve peak identification and quantitation, which in turn assures the accuracy of your results. For unequivocal peak identification, UPLC separation chemistries are fully compatible with mass spectrometry detection.

Direct cell culture sample analysis



Aliquots of cell culture media were taken directly from a bioreactor producing a biopharmaceutical protein. Samples were taken over a period of six days and no special sample preparation was required before analysis of the amino acids. The amino acid concentration trends can be plotted with growth as well as response to feeding.

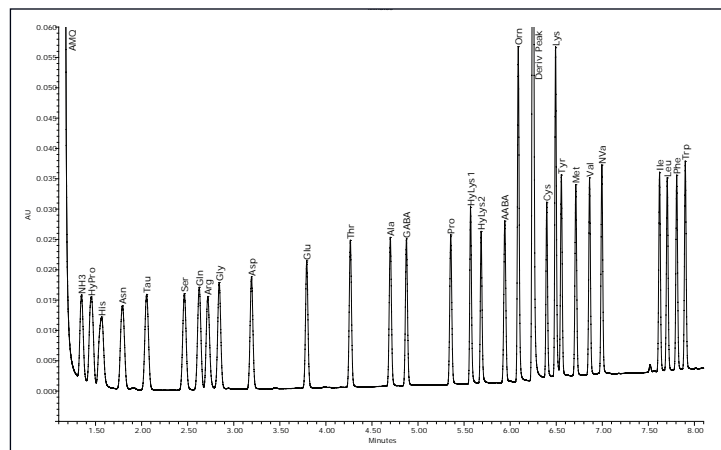
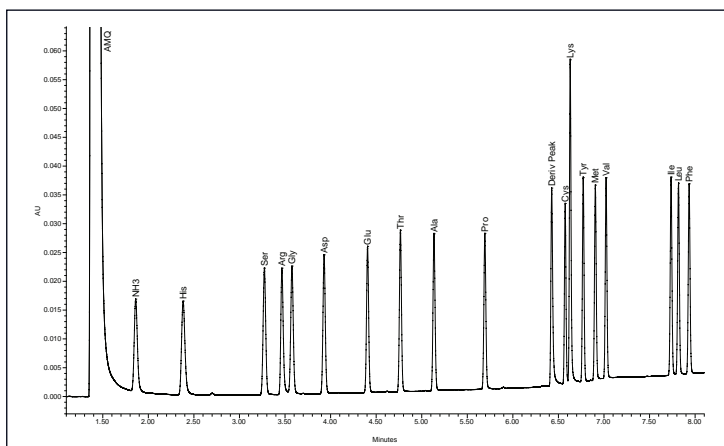
Throughput greater than what's possible with traditional HPLC

Imagine achieving accurate amino acid analysis results in a fraction of the time required by conventional methods. The dramatically higher throughput possible with UPLC enables you to make more informed decisions faster, to perform more analyses per day, and to take on more projects per year.

Qualification your lab can rely on

Because we know that getting the right answer every time is imperative for your lab, Waters has invested the time, resources, and expertise in developing comprehensive qualification services to ensure that you get the accurate and reproducible results you expect. Our application-specific Performance Qualification is specific to amino acid analysis. A Waters-certified engineer will qualify your system using pre-configured amino acid analysis methods and protocols, a QC-tested AccQ•Tag Ultra column, reagents and eluents, as well as specific qualification documentation.

Flexible methodology: Analysis of a hydrolysate standard at 10 pmol/μL and a cell culture standard at 10 pmol/μL



The trace on the left shows the analysis of a hydrolysate standard and the trace on the right shows a standard mixture of the larger number of amino acids found in cell culture media. The adaptation of the method requires only a change in dilution of the Eluent A Concentrate supplied as part of the total system solution.



GOOD SCIENCE MEANS GOOD BUSINESS

To achieve your goals, your laboratories must operate at their best. You continually balance short-term financial performance against long-term business goals. You need to meet ever-aggressive product availability and delivery schedules, which require shorter turnaround times from product development through production. Waters Assured Performance Solutions, including the UPLC Amino Acid Analysis Solution, simultaneously address laboratory productivity, efficiency, and analytical quality.

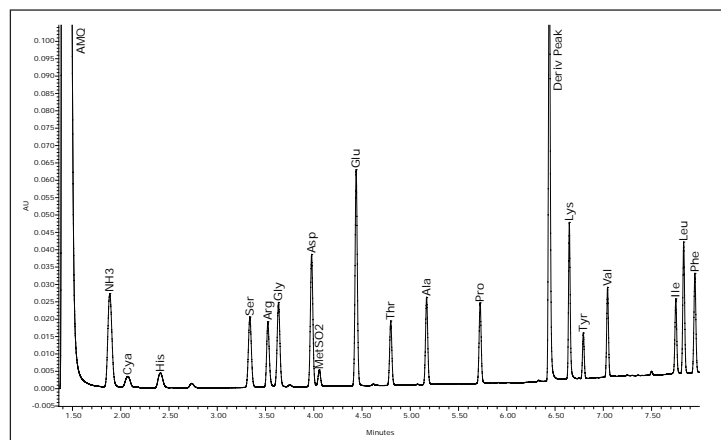
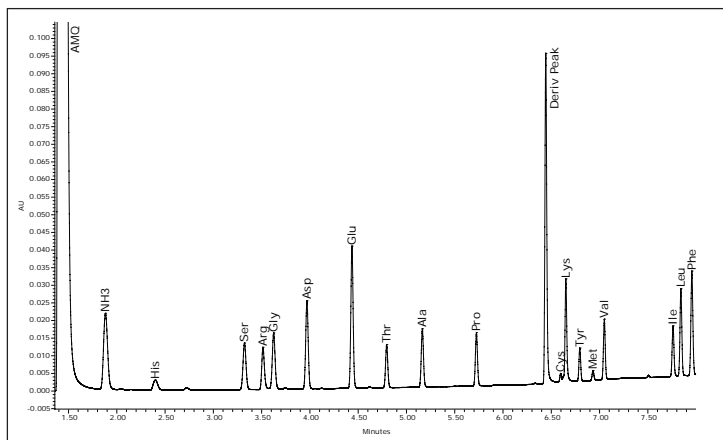
Accelerate protein characterization

You may need to determine the amino acid composition of a product and compare it with the composition deduced from the gene sequence for that product or its natural counterpart. Utilizing amino acid analysis to provide evidence of peptide or protein composition is an important tool that supports effective discovery and lead development efforts. With the UPLC Amino Acid Analysis Solution, you can characterize proteins more comprehensively and efficiently, potentially accelerating your biopharmaceutical development.

Confirm quality

Your objective is to demonstrate process consistency. Concurrently, you have a production schedule to meet – and delays in any part of the process are expensive. Monitoring cell culture media for critical nutrients allows you to optimize expression efficiencies and to make timely product harvesting decisions. The UPLC Amino Acid Analysis Solution provides the rugged, reliable performance you need to make the correct manufacturing decisions. You can depend on Waters instrumentation to enable you to achieve the product consistency you need for validated protocols. And when your analyses are complete, you can utilize Waters NuGenesis® Scientific Data Management System (SDMS) to automatically collect and archive results for easy future access.

Efficient and reliable foods and feed sample analysis: Soybean meal hydrolysate



Two samples of hydrolyzed soybean meal were analyzed. The trace on the left shows the untreated sample while the trace on the right shows the results of performic acid oxidation. Note the appearance of cysteine acid and methionine sulfone in the oxidized sample.

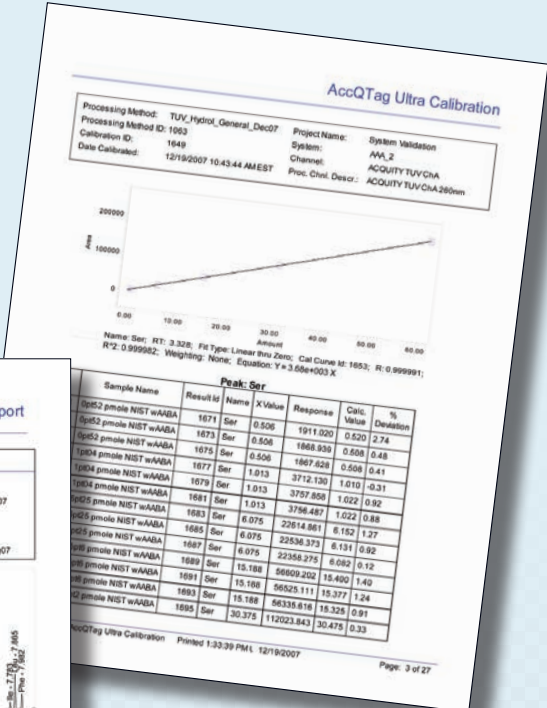
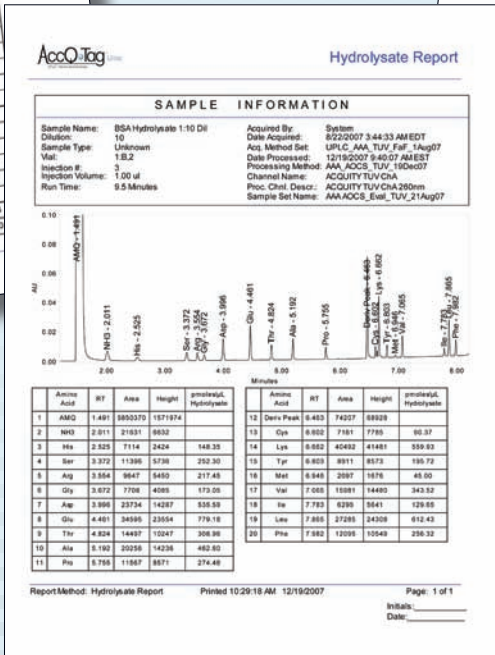
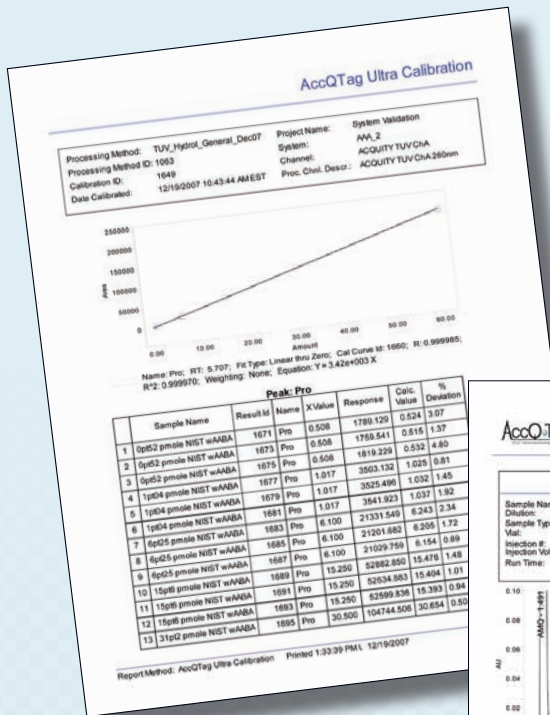
Avoid costly reformulations

Amino acids are primary nutritional components in a wide variety of agricultural feeds and food products. Are you concerned that your products are not meeting label claims for nutrient composition? With our UPLC Amino Acid Analysis Solution, you have access to Waters' extensive experience in managing these complex analytical challenges. Our system solution will enable you to get the right information, on a timely basis, so you can be assured that your products meet your manufacturing specifications.

Turnkey application support

What do protein hydrolysates, cell culture monitoring, and nutritional analysis of foods and feeds have in common? The need for trouble-free amino acid analysis. Our UPLC Amino Acid Analysis Solution comes with Empower Software projects, methods and report template to ensure that you are up and running quickly. You do not need to be an expert in amino acid analysis to get accurate, precise, and reproducible results for a broad range of samples.

CUSTOMIZED, EASY-TO-USE DATA PROCESSING AND REPORTING



The UPLC Amino Acid Analysis System Solution includes a CD with a set of processing methods and report formats that are useful for different applications. For example, the results can be reported with a sample chromatogram and the quantitative results can be reported in the most useful units for the application (e.g. mg/mL or molar ratios). Calibration reports also can be generated that summarize accuracy, precision, and linearity for the experimental measurements.

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January 2008 720001837EN LB-CP