eurofins | BioPharma Product Testing



Trace Metals Testing

With increasing attention directed toward bio/pharmaceutical product safety, the importance of screening for trace metal contamination is becoming more important. Eurofins BioPharma Product Testing offers an array of testing services for a variety of applications that contribute to product integrity, including drug substance and raw materials assays, cleaning validation, media screening, extractable/leachable studies and final product assay.

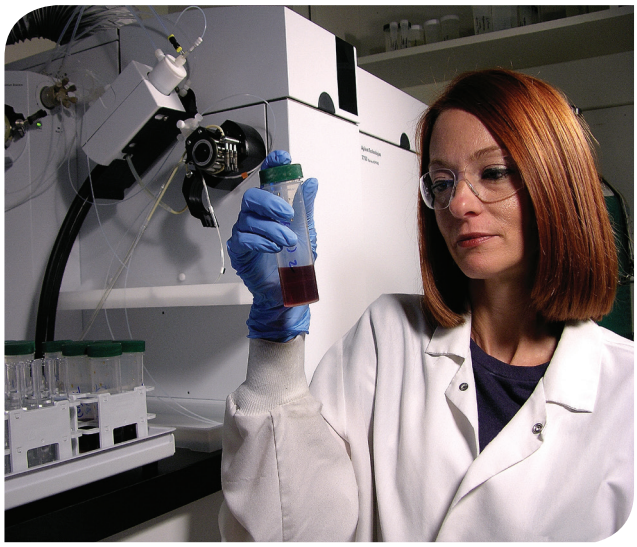
Our expertise and instrumentation enable analysts to offer a wide range of assays according to pharmacopeias (USP, EP, BP, JP, etc.), including support for the launch of USP <233> chapter for metals testing, as well as other customer specifications. Capabilities are available using ICP-MS, ICP-OES, Flame AA, Graphite Furnace AA and Cold Vapor AA (mercury).

Why Choose Eurofins BioPharma Product Testing?

- We have more than 15 years of experience developing and executing methods for trace metals analysis, using modern quantitative technology for pharmaceuticals.
- Our Metals Team has the expertise to troubleshoot complex sample matrices and method challenges.
- Our on-site pharmacopeia liaison will contact USP and EP for clarification.
- Our regulatory experience enables the team to ask the right questions and determine the most appropriate testing approach, delivering service that meets clients' needs—whether a non-GMP general screening method or a validated GMP analysis that will withstand regulatory review.
- Comprehensive instrument capacity allows for rapid turnaround time.

Key Factors

In order to develop the best approach, the Metals Team begins by determining whether the application requires validated or non-validated methods. A fully validated approach may require multiple methods, depending on the material and metals. A critical step in determining the most appropriate analytical approach is to address the following key criteria:



- Define need for a general screening method vs. specific elements of interest.
- Establish material specification limits as applicable.
- Evaluate material solubility.

Analytical Approaches

We provide a number of approaches that can be used to perform Trace Metals testing and offer pricing strategies to match a selected approach, including the following tests:

- ICP Screening
- ICP Limit
- ICP Self-Validating
- ICP Quantitative
- Flame AA
- Graphite Furnace AA
- Cold Vapor AA (Mercury)

Support for USP <232> and <233>

- Support to establish the target limit (J) for each element of interest
- Material-specific method development, ICP-OES or ICP-MS
- Method Validation for limit test or quantitative test as outlined in USP <233>
- GMP Release Testing



The Methods

The following matrix will help determine the instrumentation that best meets testing needs and provide general instrument performance guidelines, which may vary by method. For example, sensitivity limits are dependent on sample digestion approach, sample mass and instrument wavelength.

Instrument	Advantages	Limitations
ICP-MS	• Multiple element analysis (74 elements) • Isotope analysis • Quick sample throughput • ~1 to 0.001 ppb analytical detection limit range • Test trace and ultra trace analyte concentrations • Large number of sample analyses • Linear Range > 108 • Quick turnaround time	• Method development increased time • Limited solids in sample • Potential element interferences • Requires > 5 mL sample
ICP-OES	• Multiple element analysis (74 elements) • Quick sample throughput • ~100 to 0.1 ppb radial view analytical detection limit range • ~10 to 0.01 ppb axial view analytical detection limit range • Large number of sample analyses • Linear Range > 105 • Quick turnaround time	• Method development increased time • Potential element interferences • Requires > 5 mL sample
Flame AA	• Short analysis time (~68 elements) • ~100 to 1 ppb analytical detection limit range • Large number of sample analyses • Linear Range > 103 • Short method development time	• Single element analysis • Increased analyst testing time (cannot be left unattended) • Requires > 5 mL sample
GFAA	• Increased sensitivity than Flame AA • Multiple element analysis (>50 elements) • ~1 to 0.001 ppb analytical detection limit range • Linear Range > 102 • Limited element interferences	• Single element analysis • Increased analysis time than Flame AA • Limited detection range • Method development increased time • Requires ~1 mL to 2 mL of sample
CVAA	• Greater sensitivity • Limited element interferences • Quick analysis time	• Only applicable to Mercury