

# CERTIFICATE OF ANALYSIS

Product Description L-GLUTAMINE  
Product Number G229  
Lot Number 08L22918  
Storage Temperature Room Temperature  
Molecular Weight 146.14  
Formula  $C_5H_{10}N_2O_3$   
CAS Number 56-85-9

## Physiochemical Specifications:

| TEST                                     | SPECIFICATION  | RESULTS                    |
|--|--|----------------------------|
| Solubility                               | Soluble in Water @ 10 mg/mL                                      | Passes                     |
| pH                                       | Under Development  | 4.88                       |
| Physical Appearance<br>Color*<br>Texture | RM-1 to RM-3, or RM-31<br>Fine to Coarse Powder, may form clumps | RM-31 White<br>Fine Powder |
| Solution Appearance<br>Clarity<br>Color  | Clear<br>Colorless   | Clear<br>Colorless         |
| Average Time to Dissolve                 | Within 3 min   | Passes                     |
| Insolubles                               | None to Few, Small   | Few, Small                 |
| Purity                                   | Minimum 98.5%  | 99.0%                      |
| Loss on Drying                           | For Information Only   | 0.14%                      |
| Heavy Metals                             | For Information Only   | $\leq 10$ ppm              |

\* Product color based upon comparisons between sample and standardized color wheel (Benjamin Moore® Color Preview™).

## Biological Testing:

Test Concentration: 100.0 mg/L

| TEST SPECIFICATION   | PLANT CELL LINE | RESULTS |
|--|-----------------|---------|
| Supports and/or facilitates plant growth and/or shoot proliferation in two or more plant tissue cultured lines with no morphological aberrations to plants | Switchgrass     | Passes  |
|  | Birch           | Passes  |

The material described in this certificate is synthetic. No animal- or plant-derived components were used in the manufacture of this product.

**PhytoTechnology Laboratories, LLC provides the above information intended to be used only as a guide to the appropriate handling of this material by a properly trained person. PhytoTechnology Laboratories shall not be held liable for any damage resulting from handling or from contact with the above product. This product is intended for LABORATORY USE ONLY. Our products may NOT BE USED as drugs, cosmetics, agricultural or pesticidal products, food additives or as household chemicals.**

Recommended Shelf Life Date: November 2013



Gary Seckinger, Ph.D.



PhytoTechnology  
Laboratories, LLC  
Dedicated to Growth

### **PhytoTechnology Laboratories, LLC**

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