CERTIFICATE OF ANALYSIS

Product Description	MANGANESE CHLORIDE, TETRAHYDRATE
Product Number	M455
Lot Number	16E0455004
Storage Temperature	Room Temperature
Molecular Weight	197.91
Formula	$MnCl_2 \cdot 4H_2O$
CAS Number	13446-34-9

Physiochemical Specifications:

TEST	SPECIFICATION	RESULTS
Solubility	Soluble in Water @ 50 mg/mL	Passes
pH	Under Development	5.0
Physical Appearance Color* Texture	 2008-70 to 2011-70 Crystalline Powder	 2009-70 Pink Crystalline Powder
Solution Appearance Clarity Color	 Clear Colorless	 Clear Colorless
Average Time to Dissolve	For Information Only (Approx. 1 min)	1 min
Insolubles	None	Passes
Purity	Minimum 98.0%	99.8%

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

Biological Testing:

Test Concentration: 200.0 mg/mL

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	Sugar Cane	Passes
	Tobacco Callus	Passes

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

***Phyto*Technology Laboratories® provides the above information intended to be used only as a guide to the appropriate handling of this material by a properly trained person. *Phyto*Technology 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: June 2024

Gary Seckinger, Ph.D.

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ISO 9001 REGISTERED FIRM

Created on 6 June 2016 JN