

## CERTIFICATE OF ANALYSIS

Thermo Fisher Scientific's Quality System has been found to conform to Quality Management System Standard ISO9001:2015 by TUV SUD America Inc.  
 Certificate Number. 951001163

Catalogue Number	011200
Lot Number	Z20L023
Description	Thulium(III) chloride hydrate, REacton®, 99.9% (REO)
CAS Number	19423-86-0
Quality Test/Release Date	22/Dec/2025
Suggested retest date	22/Dec/2028
Country of Origin	Turkey
Declaration of Origin	Synthetic
BSE/TSE	Not directly derived from or manufactured with any animal byproducts in any way (including but not limited to fermentation or nutrient broth, catalysts, enzymes).

Result Name	Units	Specifications	Test Value
Total Rare Earth Oxide Impurities	%	0.1% max.	0.00

Additional Information Al <5 , Bi <0.2 , Ca <10 , Ce <10 , Cr <1 , Cu <5 , Dy <10 , Er <100 , Eu <50 , Fe <10 , Gd <50 , Ho <10 , K <5 , La <10 , Lu <100 , Mg 10 , Mn <1 , Na <5 , Nd <50 , Ni <1 , Pb <0.2 , Pr <10 , Si <30 , Sm <10 , Tb <10 , Th <0.2 , Ti <2 , U <0.2 , V <1 , Y <10 , Yb <500 , Zn <1 , Values given in ppm unless otherwise stated.



Derek Roy  
 Quality Manager, LCD

Products are processed under ISO 9001:2015 quality management systems and samples are tested for conformance to the noted specifications. Certain data may have been supplied by third parties. We disclaim the implied warranties of merchantability and fitness for a particular purpose, and the accuracy of third-party data or information associated with the product. Products are for research and development use only. Products are not for direct administration to humans or animals. It is the responsibility of the final formulator or end user to determine suitability, and to qualify and/or validate each product for its intended use.

Note: The data listed is valid for all package sizes of this lot of this product, expressed as an extension of the catalogue number listed above.