



Eckert & Ziegler

Analytics

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CERTIFICATE OF CALIBRATION
Standard Radionuclide Source

79105-28

I-131 5 mL Liquid in Flame Sealed Vial

Customer: LLNS/LLNL/For the U.S. DOE/NNSA
P. O. No.: B581679, Item 2

This standard radionuclide source was prepared gravimetrically from a calibrated master solution. The master solution was calibrated with an ionization chamber that was calibrated by the National Physical Laboratory, Teddington, U.K., and is directly traceable to national standards.

Radionuclide purity and calibration were checked with a germanium gamma spectrometer system. The nuclear decay rate and assay date for this source are given below.

ANALYTICS maintains traceability to the National Institute of Standards and Technology through Measurements Assurance Programs as described in USNRC Reg. Guide 4.15, Revision 1.

Isotope:	I-131
Activity (Bq):	3.411 E6
Half-Life:	8.021 days
Calibration Date:	February 25, 2009 12:00 EST
Relative Expanded Uncertainty (k=2):	1.7%

Comments:

Impurities: γ -impurities <0.1%
5.02186 grams 0.01M NaOH + 0.006M Na₂SO₃ solution with approximately 30 μ g/g I carrier.

Source Prepared By: N. E. Tibbitts
N. E. Tibbitts, Radiochemist

QA Approved: D. M. Montgomery
D. M. Montgomery, QA Manager

Date: 3-2-09

End of Certificate

Corporate Office

24937 Avenue Tibbitts Valencia, California 91355

Laboratory

1380 Seaboard Industrial Blvd. Atlanta, Georgia, 30318



U.S. DEPARTMENT OF COMMERCE

National Institute of Standards & Technology
Gaithersburg, MD 20899

Certificate of Participation

Eckert & Ziegler Analytics Atlanta, Georgia

is a participant for the period January 1, 2009, through December 31, 2009, in a radioactivity measurements assurance program conducted by the National Institute of Standards and Technology, in cooperation with NRMAP Incorporated. Continued participation is evidenced by dated Reports of Traceability issued for particular radionuclides, which indicate the deviation of the participant's reported value from that measured by the National Institute of Standards and Technology. The significance of these Reports is addressed below.*

For the Director,

A handwritten signature in black ink, appearing to read "M P Unterweger".

Michael P. Unterweger, Leader
Radioactivity Group
Physics Laboratory

*As guidance for the proper use of Reports of Traceability, it should be emphasized that the National Institute of Standards and Technology is concerned only with fostering good measurements capability and consistency with the national measurements system. The assurance of the proper application of that capability to the ultimate consumer products is the responsibility of each manufacturer of these products and of the Federal regulatory agencies.

A continuing traceability program in radioactivity demonstrates, to the degree established by the periodic assays of calibrated radioactivity samples, a continuing competence to maintain the methods and standards necessary for accurate measurement. Such a program cannot, however, endorse each and every measurement nor the final product, any more than a spot check can vouch for every unchecked item. Care should be taken, therefore, not to imply such endorsement. The proper use of this Report is governed by section 200.114 of Title 15 of the Code of Federal Regulations. These regulations may be met if Reports are quoted only in their entirety. Excerpts out of context may be misleading.

THE HISTORY OF THE UNITED STATES

FROM THE EARLIEST PERIODS TO THE PRESENT

CHAPTER I

THE DISCOVERY OF AMERICA

SECTION I

THE EARLY DISCOVERERS

The first discovery of America was made by Christopher Columbus in 1492.

He sailed from Spain and reached the island of San Salvador in the West Indies.

His voyage was the first of many that led to the discovery of the New World.

The discovery of America was a great event in the history of the world.

It opened up a new world of discovery and exploration.

The discovery of America was the beginning of a new era in world history.

It led to the discovery of many other lands and peoples.

The discovery of America was a great triumph for the human spirit.

It showed that the world was much larger than we had ever imagined.

The discovery of America was a great step towards the future.

It was a great achievement that has inspired generations.