Nuclear Reference Material Program

U.S. Department of Energy

Certificate of Analysis

Certified Reference Material 005 (100g)

Carnotite Ore

Description: Certified Reference Material (CRM) 005 consists of 100 grams of powdered carnotite ore.

Table 1. Certified Property Value [(a)]

U_3O_8 Mass Fraction (g g^{-1}) •100:	0.112
Uncertainty:	0.010

[(a)] The reported numerical uncertainty is expressed as an expanded uncertainty at the 95 % level of confidence.

Intended use: This CRM was prepared to test procedures for chemical analysis of uranium in ore type samples.

Storage: This material should be stored in its original packaging under normal laboratory environmental conditions.

Period of validity: When stored in its original, unopened container, the certification of this material is valid indefinitely. The Nuclear Reference Material Program (NRMP) will notify customers should any degradation be detected.

Traceability statement: The certified mass fraction value for U_3O_8 is metrologically traceable to the SI unit kilogram.

Instructions for handling: The material in the unit bottle is radioactive. This radioactive material should be handled only by qualified individuals. To minimize personnel exposure, appropriate facilities and personal protective equipment should be used. Refer to the Safety Data Sheet for further information.

Additional information: The property value was determined as the mean value of result from 5 laboratories (7 data sets total). Several uranium mass fraction analysis methods were used for these measurements, including colorimetry, cupferron separation with potassium dichromate, fluorescence, and radioactivity.

In 2016, the New Brunswick Laboratory facility was transitioned to a program office within the Department of Energy and is now operating within the National Nuclear Security Administration (NNSA) as the Nuclear Reference Material Program (NRMP).

Measurement uncertainties: The expanded uncertainty for the U_3O_8 mass fraction value was determined by a Linear Pool evaluation of the data sets provided by the analysis laboratories.

(Revision of Certificate Dated December 2020)
Richard Essex, Director
January 2026

Nuclear Reference Material Program
Germantown, Maryland
NRMPsales@nnsa.doe.gov