



**Certificate of Analysis**  
**Certified Reference Material C109A**  
**Monazite Sand – Silica Mixture Thorium Standard**

Thorium:  $0.01052_6 \pm 0.00009_8$  Wt.%  
( $\alpha = 0.05$ ,  $df = 9$ )

\*Uranium (calculated):  $4.18 \times 10^{-4}$  Wt.%

This Certified Reference Material (CRM) C109A was prepared by milling and blending NBL CRM 7-A Monazite Sand (9.7% ThO<sub>2</sub>) with silica (99.9% SiO<sub>2</sub>) to obtain a uniform mixture of desired thorium concentration. Characterization and certification analyses for thorium content were performed on ten (10) units selected from the packaged final product.

The certified value listed above is expressed in terms of 95% confidence limits, defined as  $\bar{x} \pm \sigma \cdot t$ , where  $\bar{x}$  is the unweighted mean of the measurement data,  $\sigma$  is the standard deviation of the mean, and  $t$  is the Student's  $t$  value for the indicated degrees of freedom ( $df$ ) and at the 5% significance level ( $\alpha$ ).

REFERENCE METHODS OF ANALYSIS: Spectrophotometry verified with NBL Thorium Oxide (ThO<sub>2</sub>).

\*Calculation is based on the uranium oxide (U<sub>3</sub>O<sub>8</sub>) value of  $0.399_3 \pm 0.017_1$  Wt% U<sub>3</sub>O<sub>8</sub> for NBL CRM 7-A Monazite Sand.