

LA-UR-

10-06879

Approved for public release;
distribution is unlimited.

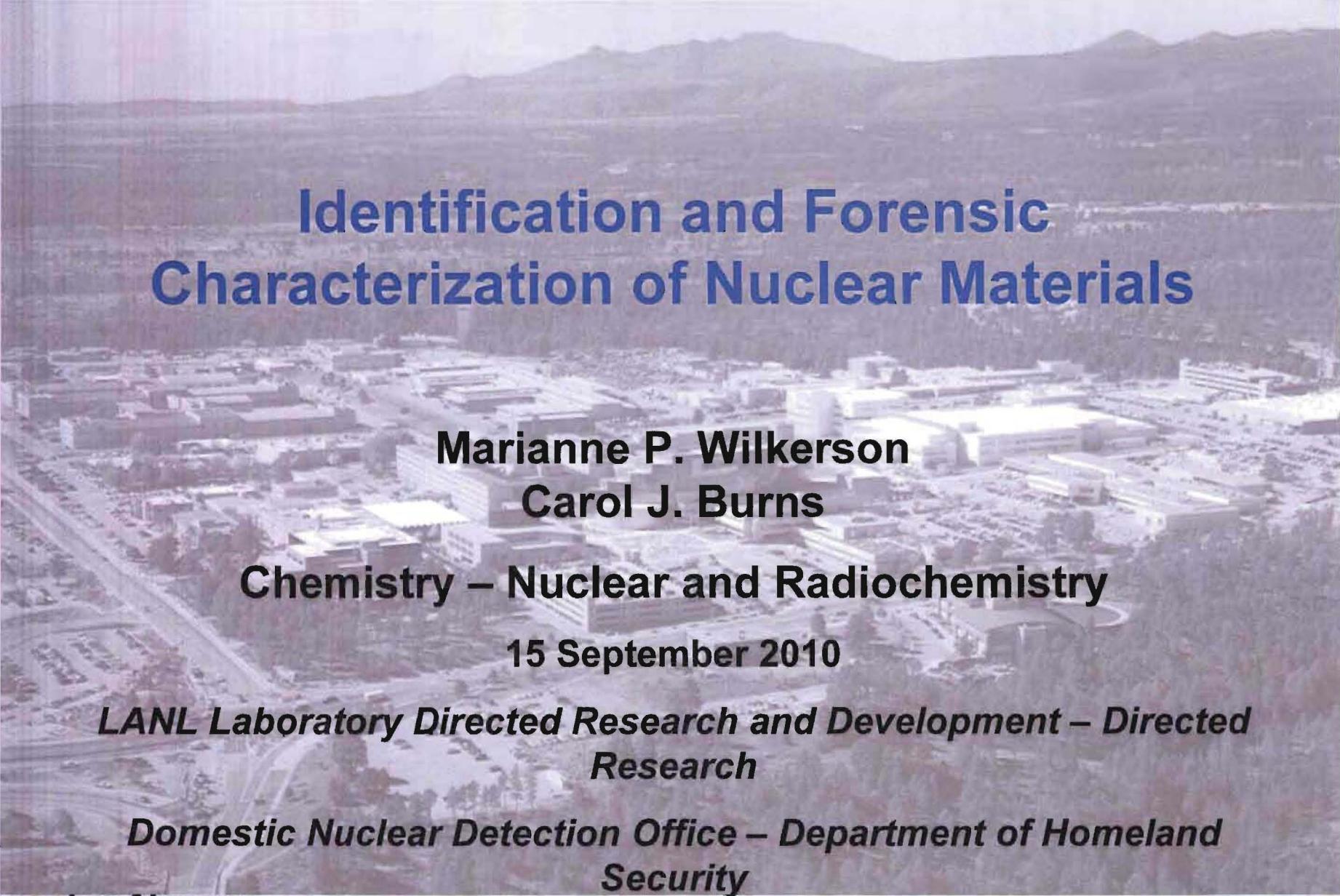
Title: Identification and Forensic Characterization of Nuclear Materials

Author(s): Marianne Wilkerson

Intended for: Meeting at Los Alamos National Laboratory with visitors from AWE
15 October 2010



Los Alamos National Laboratory, an affirmative action/equal opportunity employer, is operated by the Los Alamos National Security, LLC for the National Nuclear Security Administration of the U.S. Department of Energy under contract DE-AC52-06NA25396. By acceptance of this article, the publisher recognizes that the U.S. Government retains a nonexclusive, royalty-free license to publish or reproduce the published form of this contribution, or to allow others to do so, for U.S. Government purposes. Los Alamos National Laboratory requests that the publisher identify this article as work performed under the auspices of the U.S. Department of Energy. Los Alamos National Laboratory strongly supports academic freedom and a researcher's right to publish; as an institution, however, the Laboratory does not endorse the viewpoint of a publication or guarantee its technical correctness.



Identification and Forensic Characterization of Nuclear Materials

Marianne P. Wilkerson
Carol J. Burns

Chemistry – Nuclear and Radiochemistry

15 September 2010

*LANL Laboratory Directed Research and Development – Directed
Research*

*Domestic Nuclear Detection Office – Department of Homeland
Security*

Los Alamos
NATIONAL LABORATORY

EST. 1943

Operated by Los Alamos National Security, LLC for the U.S. Department of Energy's NNSA

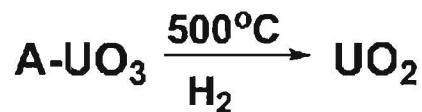
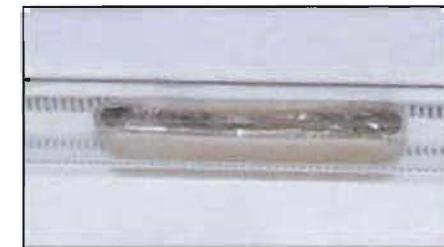
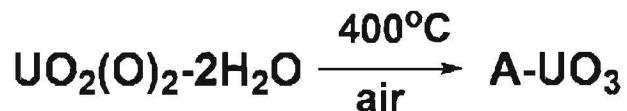
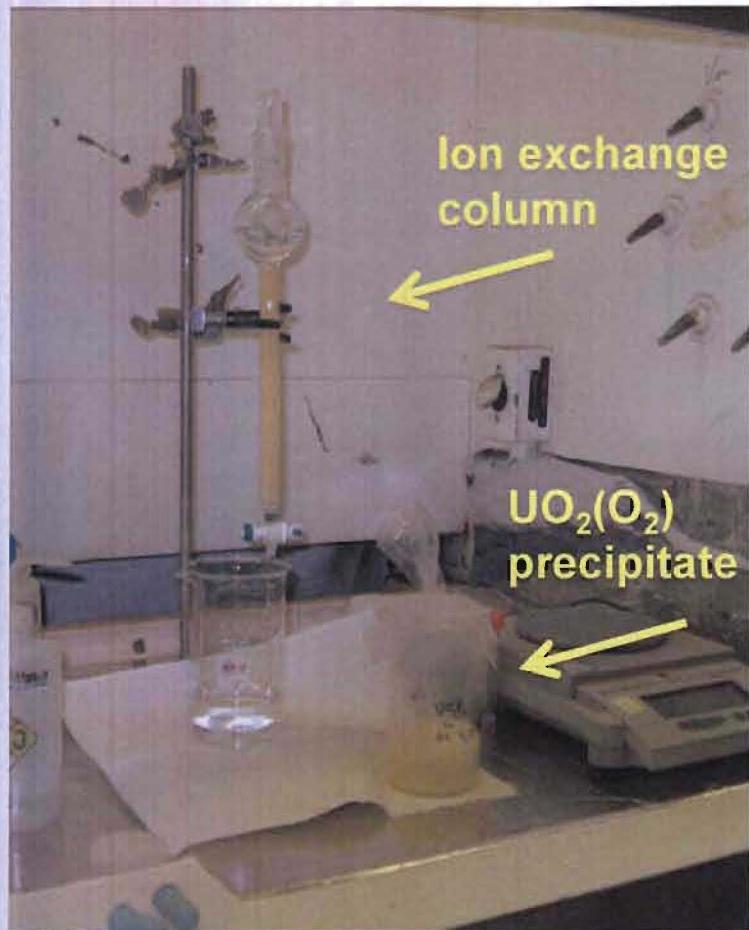
UNCLASSIFIED

Slide 1

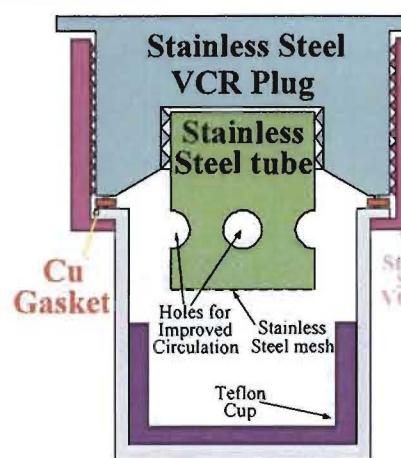
LA-UR 10-05993



Preparation of uranium oxide materials for controlled aging experiments on bulk samples.



Preparation of uranium oxide materials for controlled aging experiments on bulk samples.



-200 X Magnification



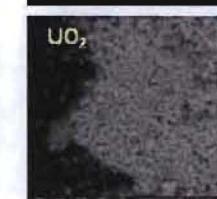
A-UO₃



-1,240 X Magnification



A-UO₃



-10,000 X Magnification



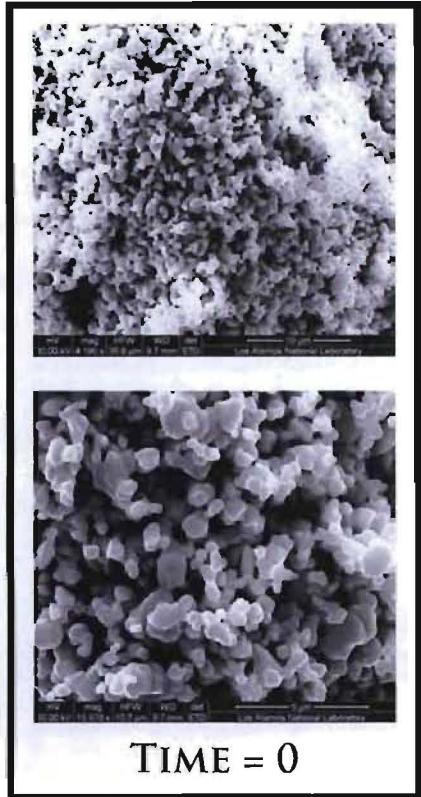
CRC Manual, Constant Humidity Solutions: $RH = A \cdot \exp(B/T)$

Lithium Iodide: 25% RH at 278.15 K

15% RH at 310.15 K

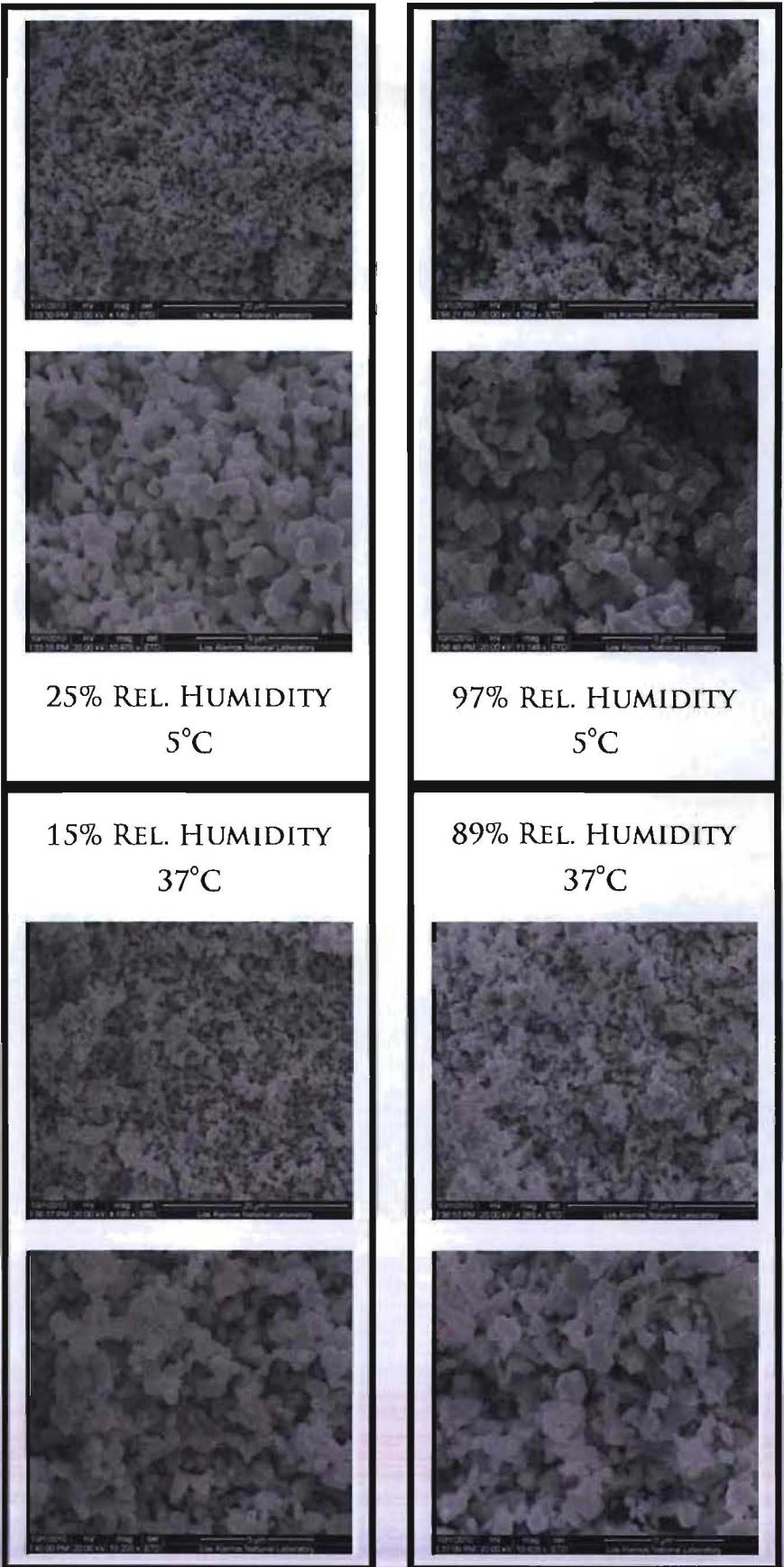
Potassium Nitrate: 97% RH at 278.15 K

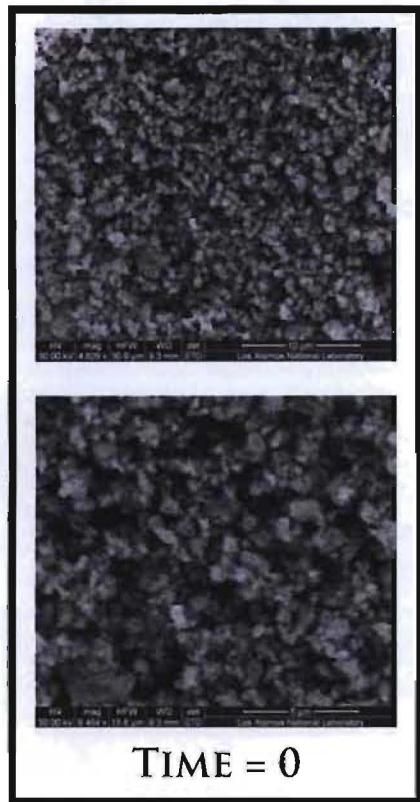
89% RH at 310.15 K



SAMPLE:
U960 U₃O₈

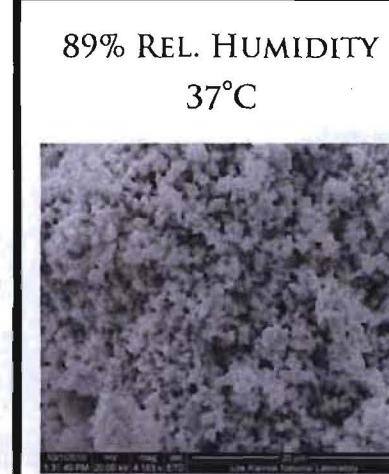
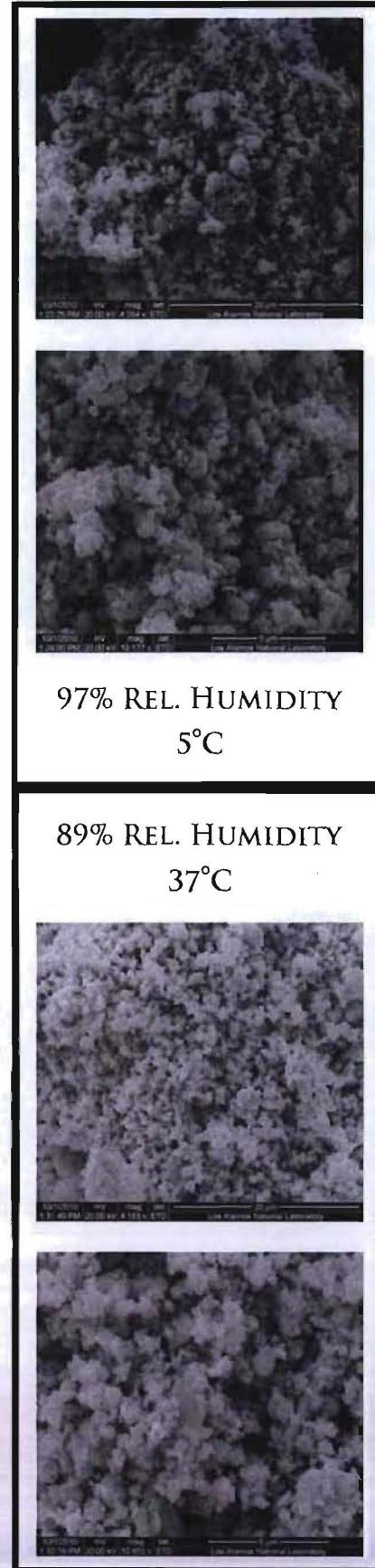
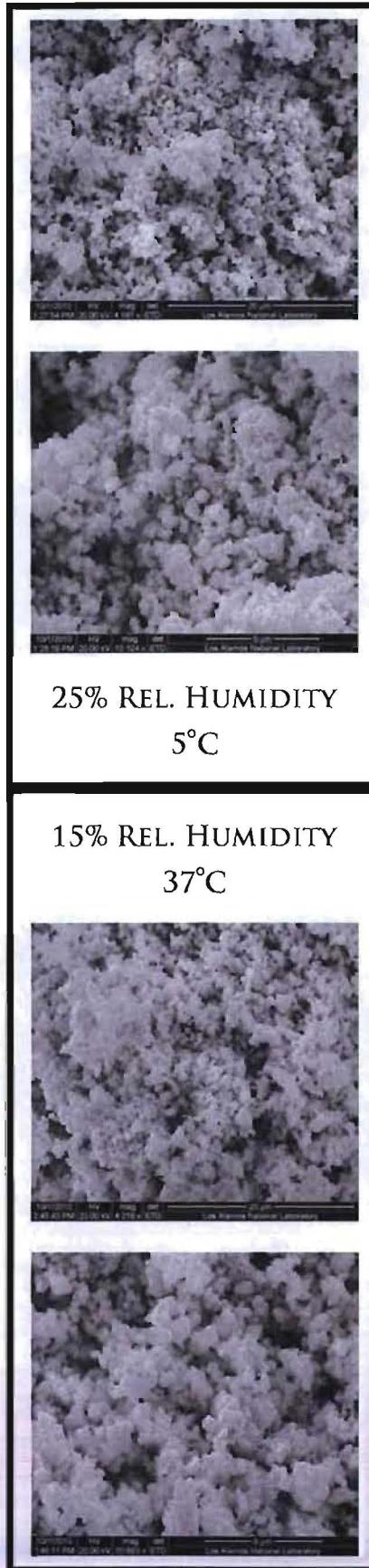
*Aged
3 months*

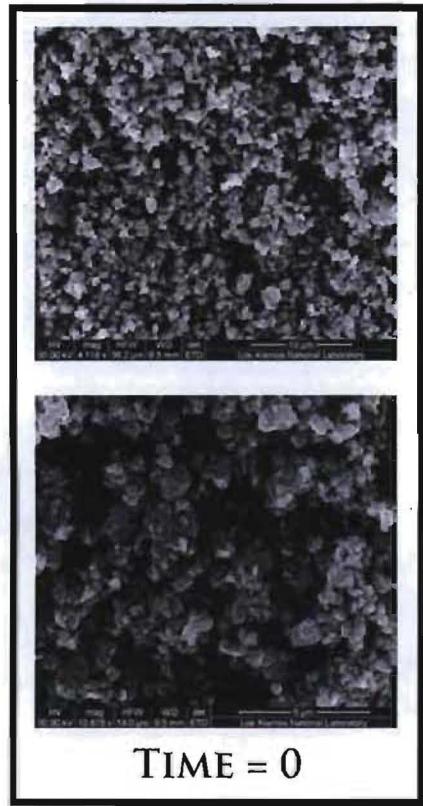




SAMPLE:
 U960 UO_2

*Aged
3 months*





SAMPLE:
U960 UO₃

*Aged
3 months*

