

THERMAL PROPERTIES OF URANIUM-MOLYBDENUM ALLOYS:
PHASE DECOMPOSITION EFFECTS OF HEAT TREATMENTS

A Thesis

by

JOHN THOMAS CREASY

Submitted to the Office of Graduate Studies of
Texas A&M University
in partial fulfillment of the requirements for the degree of
MASTER OF SCIENCE

December 2011

Major Subject: Nuclear Engineering

Thermal Properties of Uranium-Molybdenum Alloys: Phase Decomposition Effects of
Heat Treatments

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Head of Department,	Raymond Juzaitis

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An Electron Probe Microanalyzer with wavelength dispersive spectroscopy was used to observe the phases in the samples as well as to characterize each phase. The density of each sample was determined using Archimedes method. Finally, a light flash analyzer was used to determine thermal diffusivity of the samples up to 300°C as well as to estimate the thermal conductivity. For U-10Mo, thermal diffusivity increased with increasing phase decomposition from gamma to alpha + U₂Mo while U-7Mo saw a flattening of the thermal diffusivity curve with increased phase decomposition.

DEDICATION

I dedicate this thesis to my family and friends, especially my grandparents Archie, Julia Virginia, and Eldridge. I also dedicate this thesis to Miranda, Dana, Dustin, Ashley, David, and Katie. Your memories will live on.

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