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DPST-54-569

TECHNICAL DIVISION
SAVANNAH RIVER LABORATORY

Acc. No. 18423

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December 10, 1954

TO: P. H. PERMAR
FROM: W. E. JOHNSON, R. P. MARSHALL
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METALLOGRAPHY OF THORIUM

INTRODUCTION

This is a report on the metallographic techniques for thorium. These techniques are the result of a short range program undertaken by the Savannah River Laboratory in anticipation of the use of this target metal in the Savannah River Reactors.

Recently the Cooperative Committee for Thorium Metallography was formed to develop suitable metallographic procedures. Two members of this Committee have submitted their best development to date and micrographs of the resulting surfaces are presented herein for comparison.

The metal used in this program was made by the Ames process. A section of a 3-1/2 inch diameter ingot was hot rolled to 1/4 inch plate and dead annealed. After annealing, the plate was cold rolled to 5% reduction in area. The D.P.H. microhardness for the dead annealed plate was 75.6 and 86.1 for the cold rolled plate.

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GUINNESS

P. H. Permar

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December 10, 1954

RESULTS OF SRL METALLOGRAPHIC TECHNIQUES



Figure 1. Neg. # 2381 500X

As-Polished
Dead-Annealed Thorium

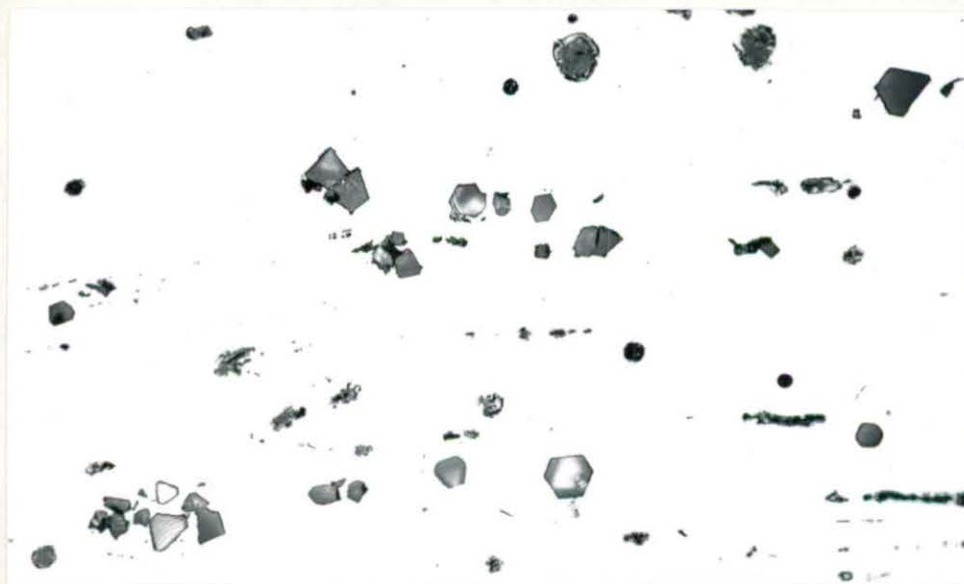


Figure 2. Neg. # 2333 500X

As-Polished
5% Cold-Worked Thorium

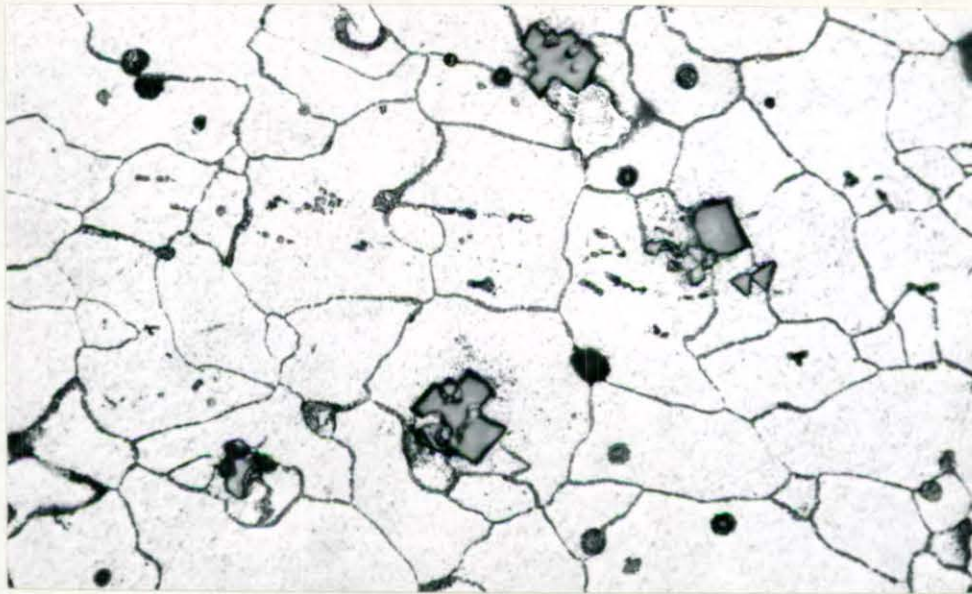


Figure 3. Neg. # 2659 500X

1.25 M HNO_3 ; 0.55 M HF
Dead-Annealed Thorium

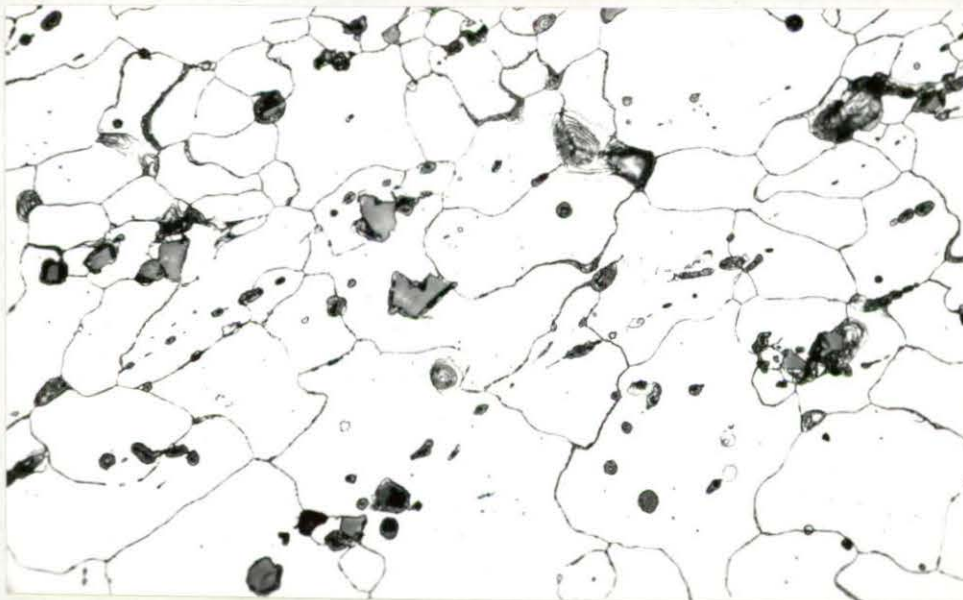


Figure 4. Neg. # 2534 500X

1.25 M HNO_3 ; 0.55 M HF
5% Cold-Worked Thorium

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RESULTS OF BMI METALLOGRAPHIC TECHNIQUE



Figure 5. Neg. # 2326 500X

As-Polished
5% Cold-Worked Thorium

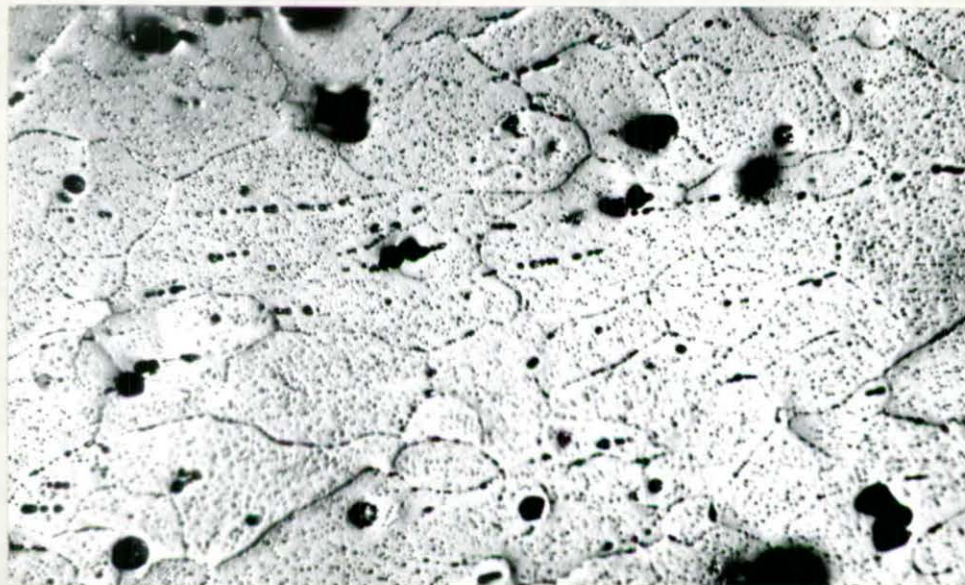


Figure 6. Neg. # 2385 500X

0.95 M HClO_4 , 15.9 M CH_3COOH
5% Cold-Worked Thorium

P. H. Permar

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RESULTS OF FMPC - NLO METALLOGRAPHIC TECHNIQUE



Figure 7. Neg. # 2779 500X

As-Polished
5% Cold-Worked Thorium

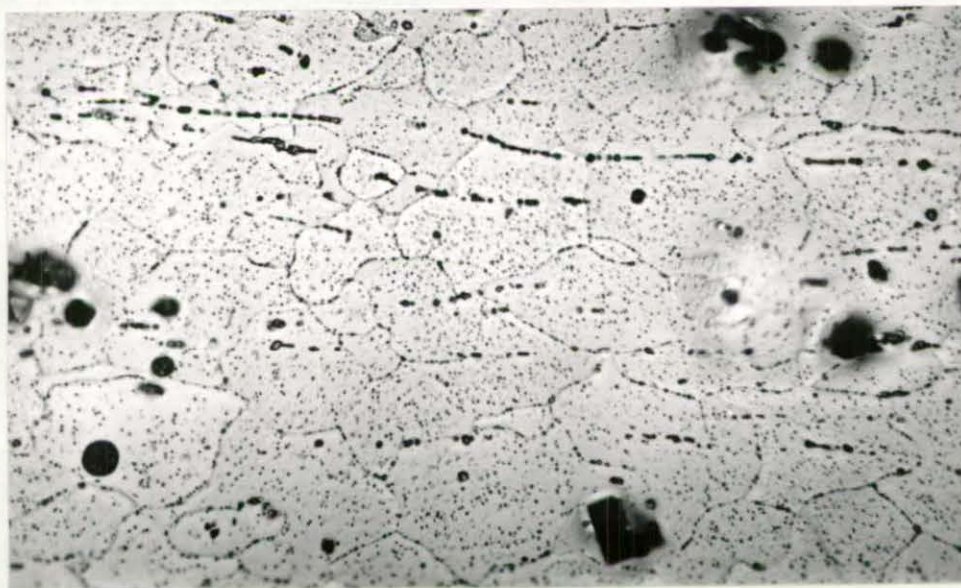
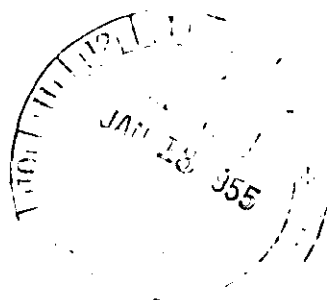


Figure 8. Neg. # 2386 500X

1.15 M HClO₄; 15.56 M CH₃COOH
5% Cold-Worked Thorium

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