

## Th-ThC Phase Diagram

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## Th-ThC Phase Diagram\*

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### Abstract

The partial phase diagram in the Th-C system between pure Th and ThC was studied by metallographic and X-ray techniques and by measurements of electrical resistivity in quenched and slow cooled Th-C alloys. The peritectic point of the reaction,  $\text{liq.} + \text{ThC} \rightleftharpoons \alpha\text{-Th}$ , was found at 16 at% C and about 1875°C and the peritectic composition of ThC was 33 at% C. The eutectic reaction occurred at 1650°C and its composition of  $\alpha\text{-Th}$  and  $\beta\text{-Th}$  was 6.5 and <0.5 at% C, respectively. The  $\alpha \rightleftharpoons \beta$  transformation temperature rose gradually with the carbon content up to 2.3 at% C and rose rapidly between the compositions of 2.3 and 3.7 at% C. The phase boundaries of  $\alpha/\text{ThC} + \alpha$ ,  $\text{ThC} + \alpha/\text{ThC}$ ,  $\text{ThC}/\text{ThC} + \text{ThC}_2$  and  $\text{liq.} + \text{ThC}/\text{ThC}$  were also established.

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