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BOOK REVIEW

Fundamentals of Heat Treatment in Fusion Energy Systems

Eds M. S. Kazimi and O. C. Jones Jr.

This publication covers six papers presented at the 21st National Heat Transfer Conference, held in Seattle, USA, in July 1983. The papers are so specialised and cover such diverse topics that no attempt has been made to comment on their technical content. The papers are:

(1) 'Some thermal hydraulics aspects of the impurity control system for FED/INTOR (Fusion Engineering Device and International Tokamak Reactor)' by Y. S. Cha, R. F. Mattas, M. A. Abdou and J. R. Haines.

The paper is in two parts, dealing with temperature calculations for the limiter and divertor and an analysis of the tangential motion of the melt layer during plasma disruption.

(2) 'Experimental study of the enhancement of critical heat flux using tangential flow injection' by J. Weede and V. K. Dhir.

Describes an investigation of the critical heat flux condition in sub-cooled flow of Freon-113 through short vertical tubes and also local flow injection as a means of CHF enhancement.

(3) 'Review of sub-cooled flow boiling critical heat flux (CHF) and its application to fusion systems, Part 1: Fundamentals of CHF' by R. D. Boyd.

A survey covering the last 30 years of only CHF in the sub-cooled flow boiling regime. A summary of the fundamentals is followed by a discussion of mechanisms and the large number of relevant parameters is enumerated (134 references).

(4) 'Review of sub-cooled flow boiling critical heat flux (CHF) and its application to fusion energy system components, Part 2: Microconvective, experimental and correlational aspects' by R. D. Boyd.

Summarizes microconvective, instability, experimental and correlational aspects of CHF (124 references).

(5) 'Thermal performance of thermionic diodes for fusion power production' by J. F. Stubbins.

Shows that fusion product heating can be used to heat thermionic emitters to 2000°K at which temperature higher efficiencies are possible.

(6) 'Thermal analysis of a helium-cooled, tube-bank blanket module for a tandem mirror fusion reactor' by R. W. Werner, M. A. Hoffman and G. L. Johnson.

Describes the analytical model used to select the best tube bank design parameters. The blanket uses solid Li_2O as the Triton breeding material contained in tubes arranged as a two-pass cross-flow heat exchanger.

The papers are clearly written and well illustrated but inevitably will be of very limited interest.

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Published, price $18, by ASME, 345 East 47th Street, New York, NY 10017, USA.