Static Capsules for TREAT Irradiations
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Overview

-The Transient Reactor Test facility (TREAT) provides neutron irradiation with flexible power maneuvering
-Experiment vehicle (capsule, loop, etc.) does the rest:
  1) Provide specimen boundary conditions
  2) Safely contain hazards
  3) Support specimens and in-situ instrumentation
-Static capsule designs planned for initial TREAT tests

Multi-SERTTA

-Multi Static Environment Rodlet Transient Test Apparatus (Multi-SERTTA)
-Four simultaneous rodlets in static PWR water (280°C, 15.5 MPa)
-Adaptable instrument/specimen holder for other specimen types
-Adaptable for use with inert gas or steam (and possibly sodium)

MARCH

-Minimal Activation Retrievable Capsule Holder (MARCH)
-Small samples, brief irradiations, and low-activation materials
  1) Post-irradiation examination (PIE) within weeks of test
  2) Simplified post-test shipment, enables glove-box PIE
  3) Reusable hardware
  - Ease in instrumentation penetration
  - Accepts fuel (including Pu) size from TEM disc to 15 cm rodlet
  - Broadly applicable experiment safety envelope

Future Capabilities

Super-SERTTA
-Enhanced natural circulation
-Larger specimen
-Highly instrumented
-Blowdown capability

Water Loop
-Full forced convection
-Highly instrumented
-Rod or bundle testing
(TREAT can drive high burnup/flux PWR bundle to current regulatory limits)

Mk-IV Sodium Loop
-Full forced convection
-Modernized historic design
-Highly instrumented
-Pin or bundle testing
(Upto 7-pin bundle)