Quiz

Why are heat treatments needed when fabricating a zircaloy cladding tube?

In order to create a specific texture

Because the fabrication process creates impurities that need to be removed

In order to induce some initial creep

Because the fabrication process causes dislocation hardening

Which statement is true about cladding creep and growth?

Cladding tubes typically experience more thermal creep than irradiation creep during reactor operation

Cladding growth results from the formation of interstitial and vacancy loops

A cladding tube with a random texture will not experience growth

Growth results in a change of shape and volume of the cladding

Which statement is not true about the cladding?

Zircaloys do not experience stress corrosion cracking during reactor operation but stainless steels do.

Irradiation induced hardening in the cladding occurs due to interstitial loops that form on prismatic planes

In zircaloy, dislocation slip occurs primarily on prismatic planes at typical reactor conditions

Unirradiated zirconium is a ductile material

What process is called “transition” in cladding oxidation?

The formation of a protective oxide layer that has slower growth

The initial oxide growth that is quadratic with time

The loss of the oxide protectiveness, resulting in an acceleration of the oxide growth

The fact that zircaloys do not experience break-away oxide growth like pure zirconium

Why is the formation of hydrides in the cladding a concern for fuel performance?

Because hydrogen is combustible and can cause explosions in the reactor

Because they are brittle and decrease cladding ductility

Because they accelerate stress corrosion cracking

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