

Requirement and Choice of Core Materials

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1 Quiz

1.1 Questions

1. Which ones of the following cannot be used as coolant for fast reactors?
(a) lead (b) water (c) Helium (d) sodium
2. Which one of the following is an undesirable characteristic of fast reactor coolant?
(a) high boiling point (b) high neutron absorption
(c) low induced radioactivity (d) low viscosity
3. Which of the following is prohibiting the use of Helium as coolant for fast reactors?
(a) high specific heat and low density
(b) low thermal conductivity and low density
(c) low specific heat and high density
(d) low thermal conductivity and low specific heat
4. Which one of the following is a result of neutron irradiation of a material?
(a) void shrinkage (b) void swelling
(c) increase in ductility (d) none of the above
5. The alloy '20 CW D9' is superior to SS316 with respect to
(a) higher creep and lower void swelling
(b) lower creep and higher void swelling
(c) lower creep and lower void swelling
(d) higher creep and higher void swelling
6. Improvement in the properties of 20 CW D9 is attributed to the modification in SS316 by
(a) increase of Si, Ti, Ni and decrease of Cr contents
(b) increase of Si, Mn, Co and decrease of Ti contents
(c) increase of Cr, Ti, Co and decrease of Ni contents
(d) increase of Cr, Mn, Si and decrease of Ti contents
7. The preferred material for structural components of fast reactors that are exposed to temperatures below 700 K is _____
8. The preferred material for structural components of fast reactors that are exposed to temperatures above 700 K is _____

1.2 Answers

1. (b) water
2. (b) high neutron absorption
3. (b) low thermal conductivity and low density
4. (b) Void swelling
5. (c) lower creep and lower void swelling
6. (a) increase of Si, Ti, Ni and decrease of Cr contents
7. The preferred material for structural components of fast reactors that are exposed to temperatures below 700 K is **304L(N)**
8. The preferred material for structural components of fast reactors that are exposed to temperatures above 700 K is **316L(N)**