

# **Selection of Materials for Reactor Internals**

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# 1 Quiz

## 1.1 Questions

1. Which one of the following is not a function of cladding material?  
(a) houses fuel pellets      (b) allows direct contact of fuel with coolant  
(c) retains fission products      (d) none of (a), (b) & (c)
2. Which of the following are desirable for a material to be used for cladding?  
(a) low melting point      (b) high resistance to corrosion  
(c) high thermal conductivity      (d) high creep
3. Mention the materials that have both low absorption cross section for neutrons and high melting point.
4. Mention the zirconium alloys that are used as cladding.
5. What is the role of reflectors in nuclear reactors?
6. Which one of the following is not a desirable characteristic of reflector in thermal (nuclear) reactors?  
(a) low neutron absorption cross section      (b) high neutron absorption cross section  
(c) high neutron scattering cross section      (d) low neutron scattering cross section
7. Which of the following is a candidate for control elements?  
(a) silver-copper-indium alloy      (b) silver-indium-nickel alloy  
(c) silver-indium-cadmium alloy      (d) silver-cadmium-copper alloy
8. Which one of the following unfavorable for the use of hafnium as control elements?  
(a) poor mechanical properties      (b) poor neutronic properties  
(c) limited availability      (d) poor physical properties
9. The material used to shield gamma radiation should possess  
(a) high mass number and high density      (b) low mass number and high density  
(c) high mass number and low density      (d) low mass number and low density
10. What is the disadvantage of lead for use as shielding material for gamma radiation?

## **1.2 Answers**

1. (b) allows direct contact of fuel with coolant
2. (b) high resistance to corrosion & (c) high thermal conductivity
3. Aluminum, magnesium, zirconium
4. Zircaloy -2 and Zircaloy – 4
5. Reflect the escaping neutrons back to the core
6. (b) high neutron absorption cross section & (d) low neutron scattering cross section
7. (c) silver-indium-cadmium alloy
8. (c) limited availability
9. (a) high mass number and high density
10. low melting point