11/29/2005

22.39 HW#14

Fall 2005 Problem Statement

1. Describe concisely the interaction of nuclear radiation with matter

2. List the radiation effect, or damage, on nuclear structural material by (a) fast neutrons, and (b) thermal neutrons.

3. Discuss the effect of irradiation time on radiation damage imposed upon (a) fuel element cladding, and (b) pressure vessels of light water reactors.

4. Calculate the energy transferred from an incident fast neutron of 2 MeV to a target atom of chromium.

5. Irradiation induced swelling is an important phenomena for materials performance in a neutron environment. Discuss the important variables that determine a material's susceptibility to swelling.