

PROBLEMS

1. A copper plate 1 cm thick reduces the intensity of a collimated beam of thermal neutrons by a factor 0.36. What is σ_t (for thermal neutrons) in barns for copper? What thickness of copper would reduce the intensity by a factor of 0.5?
2. From the literature find an example of each of the processes: $(n,n)_{\text{elastic}}$, $(n,n)_{\text{inelastic}}$, (n,γ) , (n,α) , (n,p) . Record the cross section observed in each example.
3. What is the reduction in intensity of a beam of one electron-volt neutrons passing through a 50 mg/cm² layer of boron?
4. The "average" distance a neutron goes before being absorbed in a substance whose absorption cross section is σ_a is just $1/N\sigma_a$ (N = target atoms/cc). On this basis what is the average life of a "room temperature" neutron in lithium? (Assume that $\sigma_a = \sigma_{\text{tot}}$) What is the average life in BF₃ at standard conditions?