A typically gamma-ray detector efficiency is ε≈0.1 and a minimum count rate

is *CRmin* ≈ 0.5 s-1. What is the minimum detectable mass of 32P in a sample (32P ，T1/2 = 14.26 d)

Charcoal found in a deep layer of sediment in a cave is found to have an atomic 14C/12C ratio only 30% that of a charcoal sample from a higher level with a known age of 1850 y. What is the age of the deeper layer? （14C has a half-life of 5730 y, the ratio of 14C to all carbon atoms in the environment in equilibrium was about *N14/Nc* = 1.23 x 10-12.）

What type of a radioactive source should be used, and how should it be used in thickness gauging processes if it is to be used for (a) gauging paper thickness, (b) the control of sheet metal thickness between 0.1 and 1 cm, and (c) controlling the coating thickness of adhesive on a cloth substrate?