210Po is used as a source of 5.2 [MeV] alpha particles in a Rutherford experiment. The alpha particles are directed at a gold foil of thickness 2µm (2 x 106 meters) at a rate of 100000 (105) particles per minute. The scattered particles are detected on a screen of area 1cm2 at a distance of 12cm. Use the Rutherford formula to predict the number of alpha particles observed in 10 minutes at q= 15°, 30°, and 45°.

Use the following data for your calculations:

N = 106 number of particles incident in 10 minutes

 = 19.3 [g/cm3] density of gold

mAu = 197u mass of gold atom

t = 2\*10-6 [m] thickness of foil

Z = 79 atomic number of gold

***Hint****: Note that the number density n of gold is /mAu and ke2=1.44[MeV\*fm]*