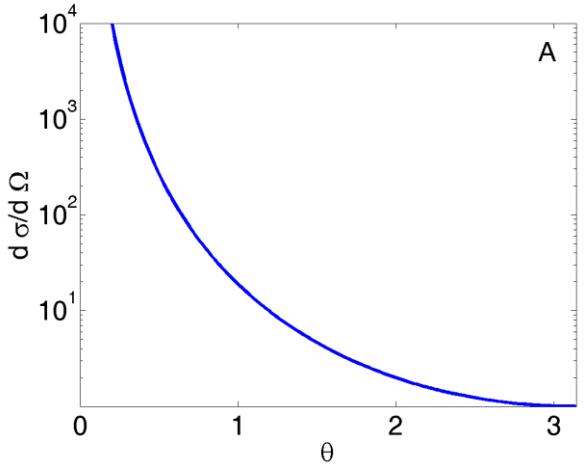
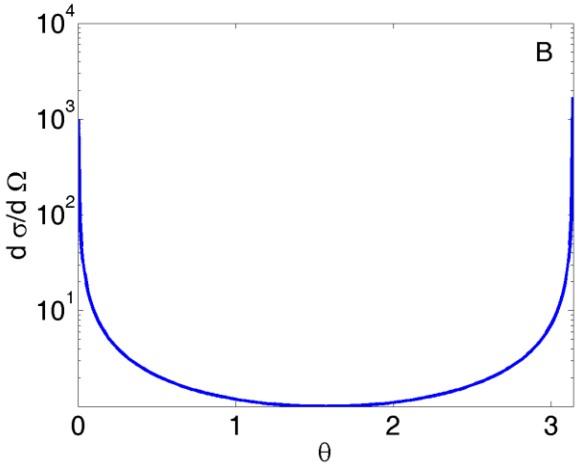
Physics 3210

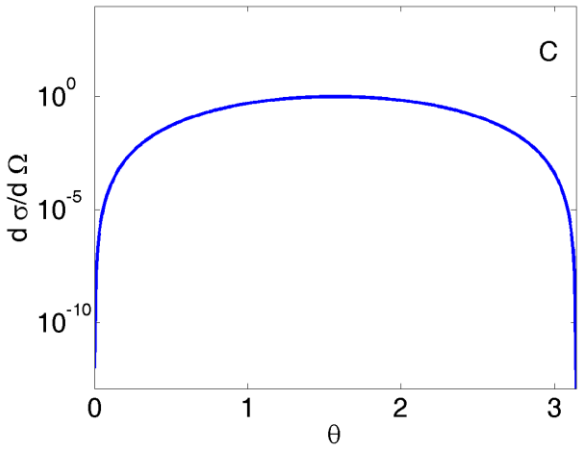
Week 8 clicker questions

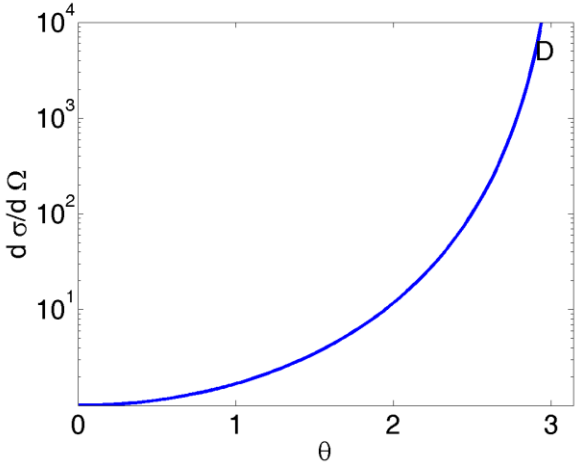
Which of the following is a plot of the Rutherford scattering cross section?

$$\frac{d\sigma}{d\Omega} = \frac{q_1^2 q_2^2}{16E^2} \frac{1}{\sin^4 \frac{\theta}{2}}$$









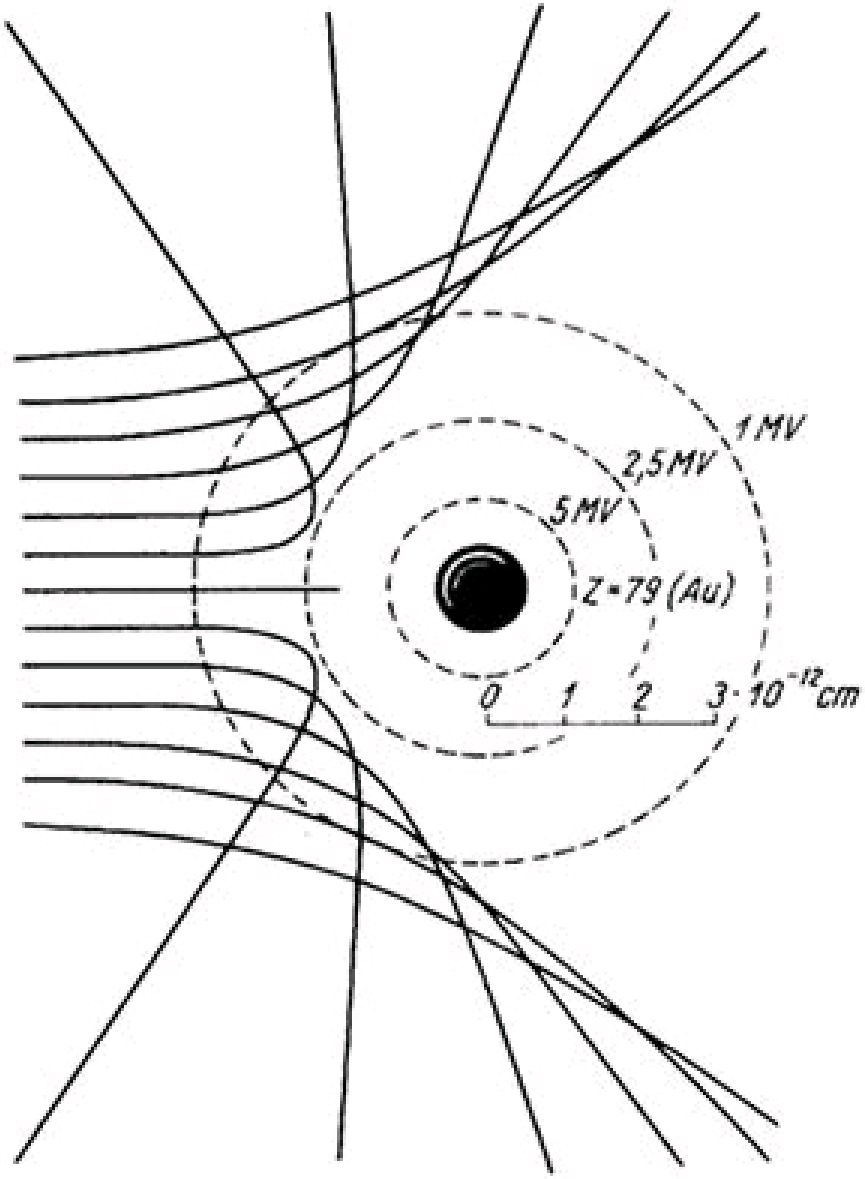
What is the total cross section for Rutherford scattering?

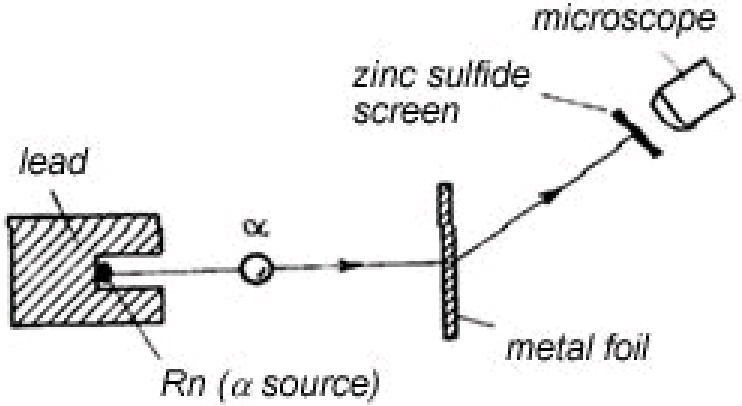
A. $\sigma = \int \frac{d\sigma}{d\Omega} d\Omega = 0$

B. $\sigma = \int \frac{d\sigma}{d\Omega} d\Omega = \infty$

C. $\sigma = \int \frac{d\sigma}{d\Omega} d\Omega = -\infty$


1871 - 1937
1971
ПОЧТА СССР
Эрнест
Резерфорд
6к


1 MV
2,5 MV
5 MV
Z = 79 (Au)
0
1
2
3 · 10⁻¹² cm


microscope
zinc sulfide screen
lead
α
metal foil
Rn (α source)

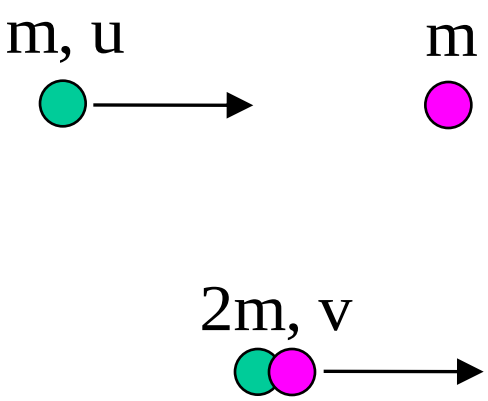
Physics 3210

Wednesday clicker questions

Physics 3210

Friday clicker questions

A moving particle (mass m, speed u) collides with a stationary particle (mass m). The two particles stick together after the collision. What type of collision is this?



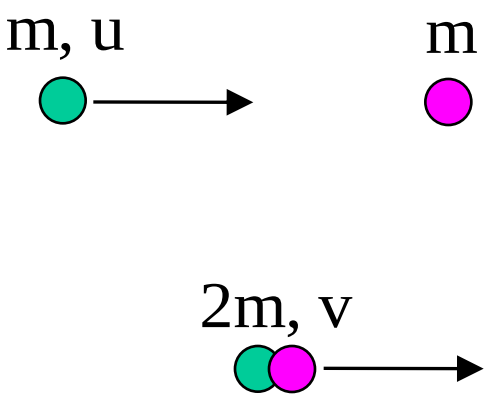
A. Inelastic.

B. Elastic.

C. Superelastic.

D. It cannot be determined from the information given.

A moving particle (mass m, speed u) collides with a stationary particle (mass m). The two particles stick together after the collision. What is the coefficient of restitution of the collision?



A. $\varepsilon = 0$

B. $\varepsilon = 0.25$

C. $\varepsilon = 0.5$

D. $\varepsilon = 0.75$

E. $\varepsilon = 1$

A rocket moves by expelling fuel. The motion is in free space. What condition must hold throughout the motion?

A. The total momentum of the rocket is constant.

B. The total momentum of the rocket-fuel system is constant.

C. The total energy of the rocket is constant.

D. The total energy of the rocket-fuel system is constant.

For a rocket moving in a constant gravitation field with constant mass burn rate, we derived the relation between the speed of the rocket and the mass

$$\int_{v_0}^{v} dv = \int_{m_0}^{m} \left(\frac{g}{\alpha} - \frac{u}{m} \right) dm$$

What is the result of the integration, assuming start from rest?

A. $v = \frac{g}{\alpha}(m_0 - m) - u \ln\left(\frac{m}{m_0} \right)$

B. $v = \frac{g}{\alpha}(m_0 - m) - u \ln\left(\frac{m_0}{m} \right)$

C. $v = \frac{g}{\alpha} m + u \ln\left(\frac{m_0}{m} \right)$

D. $v = -\frac{g}{\alpha}(m_0 - m) + u \ln\left(\frac{m_0}{m} \right)$