PH 105 – Quantum Mechanics

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6)

λ' – λ = h(1-cosθ)/mc

θ = π/2

λ' – λ = h/mc

Compton shift in both cases is the same

Δλ = 6.626\*10-34/(9.1\*10-31 x 3\*108)

**Δλ = 0.024 Å**

Conservation of energy gives,

hc/ λ = KE + hc/ λ'

KE = hc Δλ/[ λ\*( λ+ Δλ)]

For X- ray

**KE = 0.295 KeV**

For γ ray

**KE = 0.37 MeV**

% energy lost in collision

X-ray : 0.295 KeV/ [(hc/ λ)] = **2.37%**

γ ray : 0.37 MeV/ [(hc/ λ)] = **56%**