Chem 322 (Sturgeon) Name _____

Particle – Wave Duality

1) Consider a proton with a mass of 1.6726219 e-27 kg; when this particle would express "wave-like" properties (like when diffracting thru a 0.3 nm slit/NiO crystal), what is the required velocity and energy in order for this particle to exhibit wave-like properties?

2) Consider a wave with a frequency of 2.73e14 s^{-1} ; when this wave would express "particle-like" properties, what is the expected mass?