Chem 322 (Sturgeon) Name _____

Particle – Wave Duality

1) What is the "deBroglie" wavelength of an electron traveling at 2.0% of the speed of light?

2) What is the required ***velocity*** of an electron in order to cause a diffraction pattern in a crystal with 2.4e-10 m atom spacing? *Hint: the wavelength must be ~ the atom spacing*. If you divide this velocity (your answer) by the speed of light (c) *100, then you can report this value as a % of the speed of light…you should get 1%.

3) The best diffraction pattern occurs when the velocity of the electron is equal to the atoms spacing. What is the velocity of the tuned electron bean when measuring the diffraction pattern from diamond and from graphite?