Energy of a photon

Momentum of a photon

Perhaps particles can be thought of as waves:

frequency wavelength

In order for constructive interference to occur the Bragg conditions must be satisfied:

The electrons that leave the cathode can have very little kinetic energy, but a potential energy of eV. When they reach the anode, all of this potential energy has been converted into kinetic, so:

which gives the momentum of the electrons

and thus the wavelength

Using this result with Eq. 2 gives;

using the small angle approximation gives