The Photoelectric Effect

Equations and constants:

$$KE = \tfrac{1}{2}m_e v^2 = h\nu - h\nu_o$$

$m_e = 9.10939 \times 10^{-31}$ kg $h = 6.626 \times 10^{-34}$ J s $c = 2.9979 \times 10^8$ m s^{-1} 1 nm = 10^{-9} m

1. Light of various wavelengths is shined on a sample of lithium metal, which has a work function of 279.7 kJ/mol. The wavelengths of the light are given in the table. For each, calculate the frequency and energy of the photons then determine whether electrons are ejected from the metal. If electrons are ejected, calculate their velocity and kinetic energy. Complete the table with your calculated values.

λ (nm)	ν (s^{-1})	E (kJ/mol)	e- ejected?	e- velocity (m/s)	Kinetic Energy (J)
628.0					
528.0					
428.0					
328.0					
228.0					

2. Graph the kinetic energy of the ejected electrons vs. the frequency of light. Determine the threshold frequency from the graph. How does this frequency relate to the work function?