

ep16)

$$d = 1.67 \text{ nm}$$

$$\theta_1 = 17^\circ$$

$$\theta_2 = 35.7$$

$$d \sin \theta = m \lambda$$

$$\lambda = \frac{d \sin \theta}{m}$$

$$\lambda = \frac{1.67 \cdot 10^{-6} \text{ m}}{1} \sin(17^\circ) = 0.48826 \text{ nm}$$

$$\lambda = \frac{1.67 \cdot 10^{-6} \text{ m}}{2} \sin(35.7^\circ) = 0.48726 \text{ nm}$$

$$\lambda = 488 \text{ nm}$$

ep17)

$$a) m = 21,000 \text{ kg}$$

$$v = 300 \text{ m/s}$$

$$\lambda = \frac{h}{p} = \frac{h}{mv}$$

$$\lambda = \frac{6.626 \cdot 10^{-34}}{(21,000)(300 \text{ m/s})} = 1.052 \cdot 10^{-40} \text{ m}$$

$$b) m = 1.67 \cdot 10^{-27} \text{ kg}$$

$$v = 300 \text{ m/s}$$

$$\lambda = \frac{6.626 \cdot 10^{-34}}{(1.67 \cdot 10^{-27})(300)} = 1.3223 \text{ nm}$$