

$$\phi = 4.20 \text{ eV}$$

a) Cutoff f and λ occur when $KE_{\text{max}} = 0$

$$KE_{\text{max}} = h \cdot f - \phi$$

$$0 = (4.14 \times 10^{-15} \text{ eV} \cdot \text{s}) f - (4.20 \text{ eV})$$

$$f = 1.01 \times 10^{15} \text{ Hz}$$

Cutoff λ corresponding to this f :

$$v = f \cdot \lambda$$

$$(3 \times 10^8 \text{ m/s}) = (1.01 \times 10^{15} \text{ Hz}) \cdot \lambda$$

$$\lambda = 296 \text{ nm}$$

b) Find KE_{max} for $\lambda = 180 \text{ nm}$

$$KE_{\text{max}} = \frac{h \cdot c}{\lambda} - \phi = \frac{(1240 \text{ eV} \cdot \text{nm})}{(180 \text{ nm})} - 4.20 \text{ eV}$$

$$KE_{\text{max}} = 2.69 \text{ eV}$$

so

$$V = 2.69 \text{ V}$$