P #54

Ch 27

$\lambda_1 = 670\ nm$ $\quad \phi_1 = \phi_2 = ?$

$\lambda_2 = 520\ nm$

$KE_2 = 1.5 \cdot KE_1$

$$KE_1 = \frac{hc}{\lambda_1} - \phi \quad \text{and} \quad KE_2 = \frac{hc}{\lambda_2} - \phi$$

$$\text{so} \quad 1.5\,KE_1 = \frac{hc}{\lambda_2} - \phi$$

Substituting: $$1.5\left[\left(\frac{hc}{670\,nm}\right) - \phi\right] = \frac{hc}{520\,nm} - \phi$$

$$1.5(1.85\,eV - \phi) = 2.38 - \phi$$

$$2.78 - 1.5\phi = 2.38 - \phi$$

$$\boxed{\phi = .78\ eV}$$