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30/9. HW # 4.

1. $E(2,8,3) = \frac{\pi^2 h^2}{2m}(2^2+8^2+3^2)$

$= \frac{\pi^2 (1.05\times10^{-34})^2}{2(9.11\times10^{-31})}(4+64+9)$

$= 4.549e-36.$

2. $E(2,2) = \frac{\pi^2 (1.05\times10^{-34})^2}{2(9.11\times10^{-31})}(2^2+2^2)$

$= 4.78e-37.$

3. $k\ 1.46\times10^{23}$

Mass?

$1.46\times10^{23}\times 6.022\times10^{24} = \frac{8.79e^{57}}{39}$

$= 2.25e56.$

4. Density of Germanium $\rightarrow$ 5323 kg/m^3

$10cm^3$ $\frac{5323}{100.} = 53.23.$ kg/cm.

$53.23\times10 = \underline{523.3}$

5. $6.4\times10.81 = 69.184 \times 6.022\times10^{24} = \underline{4.166e38.}$

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6. $2.3 \times 10^{23} \rightarrow Rb$.

$\frac{2.3 \times 10^{23}}{6.022 \times 10^{24}} = 3.819e^{-12} \times 85.47$

$= 3.26e-10$

7. Sr 5.32eV. → 0eV.
Weighs 12.3g.

EV between 5.32 → 0.

$E(2,8,18,8,2) = \frac{\pi^2 (1.055 \times 10^{-34})^2}{2(9.11 \times 10^{-31})} (2^2+8^2+18^2+8^2+2^2)$

$= 2.747e^{-37} \times 1.68 \times 10^{19}$

$= 2.923e^{-18}$ EV.

8. $\Delta E = 7.051 \times 10^{-23}$ eV.

$\frac{7.051 \times 10^{-23}}{1.064 \times 10^{19}} = \frac{6.6268e^{-42} \cdot 2(9.11 \times 10^{-31})}{(2^2+1^2)\pi^2(1.055 \times 10^{34})^2}$

$= 0$ eV.

9. Cd Ag_2 Ge_4 Ga_2 Se_4 P.

Cd → 2
Ag → 2(1) → 2
Ge → 4(4) → 16
Ga → 2(3) → 6
Se → 4(6) → 24
P → 2(5) → 10.

$\frac{2+2+16+6+24+10}{15}$

= 4.

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10. Tetrahedral Tetrahedrite structure.

(A). Cu In Se

11. CdnTe → Tetrahedral Sem.

(3).

12. (D). GaAs

13. (B) $\lambda = 785nm$

14. GaAs, $E_g = 1.42eV$. (B)