

formulas provided (see handouts; sample exams on eCommons before midterms)

NAME: KEY

SID: _____

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Chemistry 1B

SAMPLE QUESTIONS for MIDTERM#1

ALL work should be done in the space provided. GOOD LUCK !!

Useful formulas and constants:

$$h = 6.626 \times 10^{-34} \text{ J}\cdot\text{s}$$

$$\frac{h}{4\pi} = 5.273 \times 10^{-35} \text{ J}\cdot\text{s}$$

$$c = 2.998 \times 10^8 \text{ m/s}$$

$$m_e = 9.11 \times 10^{-31} \text{ kg}$$

$$1 \text{ amu} = 1.66 \times 10^{-27} \text{ kg}$$

$$(m\Delta v) \Delta x \geq \frac{h}{4\pi}$$

$$\frac{1}{\lambda} = (1.097 \times 10^7 \text{ m}^{-1}) Z^2 \left(\frac{1}{n_1^2} - \frac{1}{n_2^2} \right) \quad n_2 > n_1$$

$$E_n \approx -(2.18 \times 10^{-18} \text{ J}) \frac{Z_{eff}^2}{n^2}$$

$$\bar{r}_n \approx \frac{n^2}{Z_{eff}} a_0 \quad a_0 = 5.29 \times 10^{-11} \text{ m}$$

$$h\nu_{\text{photon}} = \Phi_{\text{metal}} + \text{K.E.}$$

$$\text{K.E.} = \frac{1}{2} mv^2$$

wavelength range of visible light :
 $\lambda \approx 4.0 \times 10^{-7} \text{ m}$ to $7.0 \times 10^{-7} \text{ m}$

$$N_A = 6.022 \times 10^{23} / \text{mol}$$

know:

$$\lambda\nu=c \quad E=h\nu \quad p\lambda=h$$

but: