

Analytical Cumulative Exam
12/10/05

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Written by Dr. Mao

Biochemistry Cumulative Exam
12/10/05

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Written by Dr. VanEtten

Inorganic Cumulative Exam
12/10/05

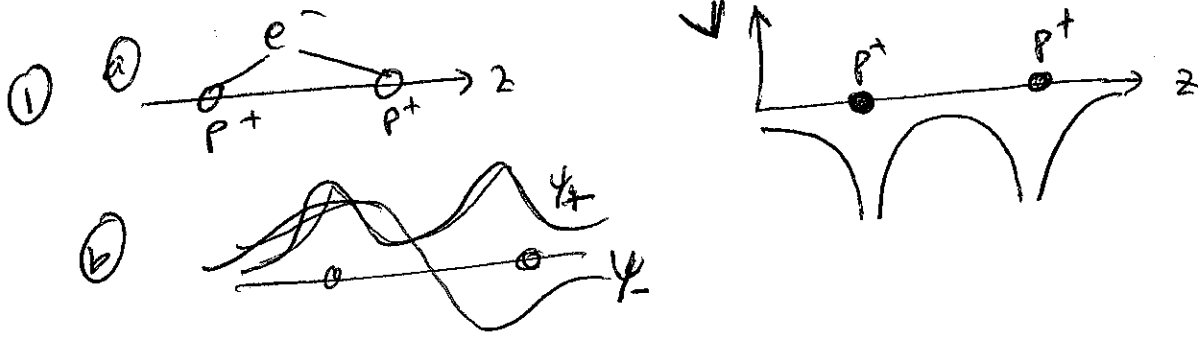
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Written by Dr. Robinson

Organic Cumulative Exam
12/10/05

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Written by Dr. Grutzner



(c) overlap between the two wave functions, resonance of the electron

$D_e \approx 65 \text{ kcal/mol} (\approx 100)$

(d) $H + H^+$ (hydrogen + proton)

(e) $m_p \gg m_e$ fix the protons while electron is moving

Rydberg

- 2 (a) NO (b) $E = \frac{\hbar^2}{8\pi^2 m L^2} [n_x^2 + n_y^2]$ [(1,1) [(1,2) (2,1) [(2,2) [(1,1,1) [(2,1,1) (1,2,1) (1,1,2)]
- (c) NO (d) $E = \frac{\hbar^2}{8\pi^2 m c^2} (n_x^2 + n_y^2 + n_z^2)$
- (e) NO

- 3 (a) NO (b) NO (c) Yes (d) NO (e) NO
- Yes \equiv normalizable NO \equiv Can't be normalized

4 (a) Yes $\psi(x=0) = \psi(x=a) = 0$

(b) $P(E) = \psi^* \psi = \frac{2}{a} \sin^2 \frac{n\pi}{a}$

(c) Particle in a box problem

(d) $E = \frac{\hbar^2}{8ma^2}$

(e) Yes, π -electron in one-dimensional box | e-e-c-c-c-|