

Uva Wellassa University of Sri Lanka
Faculty of Science and Technology
Department of Science and Technology
100 Level 1st Semester Examination – May/July 2017
BBST 141-3 General Chemistry
Part C – Essay Questions

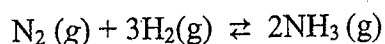


Answer all the questions

1. The energy of a single quantum is given by $E = h\nu$ where $\nu = c/\lambda$. All the symbols have standard meanings. Planck's constant is 6.63×10^{-34} Js and speed of light is 3.0×10^8 ms⁻¹. Calculate the energy in joule of

- (a) a photon with a wavelength of 5.00×10^4 nm (IR region) (20 Marks)
(b) a photon with a wavelength of 5.00×10^{-2} nm (X-ray region) (20 Marks)
(c) Which photon has the higher energy (20 Marks)

2. N₂, H₂ and NH₃ is in a container having 3.50 L at 375°C. These species can form an equilibrium as shown in the following reaction.



The concentrations of N₂, H₂ and NH₃ are 7.11×10^{-1} M, 9.17×10^{-3} M and 1.83×10^{-4} M respectively. It is given that the K_c for the above system at 375 °C temperature is 1.2. Decide whether the system is at equilibrium. If it is not predict which way the net reaction will proceed.

(60 Marks)

3. What do you understand by following terms. Provide at least one balanced chemical reaction for each

- a. Combination reaction (20 Marks)
b. Decomposition reaction (20 Marks)
c. Single-displacement reaction (20 Marks)
d. Double displacement reaction (20 Marks)