

Chemistry 101- Dr. Macintosh After exam 3 Study Guide

- 1) Be able to define all terms from the reading schedule.
- 2) Know that in order for a chemical reaction to occur the reactant particles (a) must collide (b) must collide with a minimum total kinetic energy called the activation energy and (c) must collide with the proper orientation.
- 3) Know that as the concentration of the reactants increases the rate of reaction increases and be able to explain why.
- 4) Know that as the surface area of a solid increases that rate of reaction increases and be able to explain why.
- 5) Know that as the temperature increases the rate of reaction increases and be able to explain why.
- 6) Know that the presence of a catalyst increases the rate of reaction and be able to explain why.
- 7) Given the chemical equation, be able to the equilibrium constant expression for a reaction.
- 8) Be able to use LeChatelier's principle to predict how changes in concentration, changes in temperature and the presence of a catalyst will affect the position of the equilibrium
- 9) Be able to determine the number of protons, neutrons and electrons in an atom of an isotope given its symbol in the form ${}^Z\text{X}$ or its name in the form element-Z, where Z is the mass number of the isotope.
- 10) Be able to list the 3 types of naturally occurring radiation. Know which symbol to use for the various types of radioactivity.
- 11) Know that alpha particles are a helium nucleus and be able to explain why they don't travel far.
- 12) Know that beta radiation is a stream of high-energy electrons.
- 13) Know that gamma radiation has no mass and is quite penetrating.
- 14) Be able to order alpha, beta and gamma radiation in terms of mass, penetrating ability, charge and ease of shielding.
- 15) Be able to balance nuclear equations that are missing one symbol.
- 16) Know that a radioactive decay step can produce a stable isotope or another radionuclide.
- 17) Be able to list 3 sources of background radiation
- 18) Be able to explain why radon is hazardous (Be specific, don't just say its radioactive).
- 19) Be able to calculate the amount of a radioactive sample left from the number of half-lives passed.
- 20) Be able to explain how a PET scan works, including how the positron-emitting radionuclide can be gotten inside the tissue, like the brain. Be able to describe 2 diagnostic uses for it.