Topic 11 – How Far How Fast II

* I can construct rate equations of the form Rate = k[A]m[B]n where m and n are the orders of reaction with respect to reactants A and B (restricted to the values 0, 1 and 2) and k is the rate constant, I can appreciate that the rate equation is an experimentally derived relationship (Paper 2 only)
* I can define the terms order of reaction and rate constant (Paper 2 only)
* I can explain the rate constant k varies with temperature as shown by the equation: k = Ae(–Ea/RT) (where A is a constant, known as the Arrhenius constant, Ea is the activation energy and T is the temperature in K), perform calculations using this equation and rearrange this equation to plot a straight line graph with slope Ea/R given suitable data (Paper 2 only)
* I can use the orders with respect to reactants to deduce information about the mechanism of a reaction and its rate determining step in particular (Paper 2 only)
* I can use concentration–time graphs to deduce the rate of a reaction, including the initial rate of a reaction (Paper 2 only)
* I can use rate–concentration data or graphs to deduce the order (0, 1 or 2) with respect to a reactant and derive the rate equation for a reaction from the orders with respect to each of the reactants (Paper 2 only)
* I can carry out and describe an experiment to measure the rate of a reaction and the order of reaction with respect to a reactant using the initial rate method **(Required Practical 7a)**
* I can carry out and describe an experiment to measure the rate of a reaction with respect to a reactant using a continuous monitoring method **(Required Practical 7b)**
* I can construct an expression for the equilibrium constant Kp from the equation for a reversible reaction occurring in the gas phase, using the partial pressures for a system at constant temperature (Paper 1 only)
* I can derive partial pressure from mole fraction and total pressure and perform calculations involving Kp (Paper 1 only)
* I can predict the qualitative effects of changes in temperature and pressure on the position of equilibrium and the value of Kp (Paper 1 only)
* I can explain that whilst a catalyst can affect the rate of attainment of an equilibrium, it does not affect the value of the equilibrium constant (Paper 1 only)