Topic 2 – Amount of Substance (both Papers)

* I can describe the Avogadro constant as the number of particles in a mole and I can carry out calculations using the Avogadro constant
* I can use moles to describe the amount of electrons, atoms, molecules and ions in a formulas and in equations
* I can describe the concentration of a substance in solution, measured in mol dm–3
* I can carry out calculations using mass of substance, *M*r, and amount in moles
* I can carry out calculations using concentration, volume and amount of substance in a solution
* I can state the ideal gas equation *pV* = *nRT* with the variables in SI units
* I can use the ideal gas equation in calculations
* I can write balanced equations for reactions studied
* I can balance equations for unfamiliar reactions when reactants and products are specified
* I can use balanced equations to calculate masses, volumes of gases, and concentrations and volumes for reactions in solutions
* I can determine the number of moles of water of crystallisation in a hydrated salt by titration
* I can define empirical formula as the simplest whole number ratio of atoms of each element in a compound
* I can define molecular formula as the actual number of atoms of each element in a compound
* I can describe the relationship between empirical formula and molecular formula
* I can calculate empirical formula from data giving composition by mass or percentage by mass
* I can calculate molecular formula from the empirical formula and relative molecular mass
* I can define percentage atom economy as: molecular mass of desired product

sum of molecular masses of all reactants × 100

* I can explain the economic, ethical and environmental advantages for society and for industry of developing chemical processes with a high atom economy
* I can use balanced equations to calculate percentage atom economies
* I can use balanced equations to calculate percentage yields
* I can make up a volumetric solution and carry out a simple acid–base titration (**Required Practical 1**)