Extended Essay Ideas & Internal Investigation Ideas for IA Chemistry

1. Investigate intermolecular forces.
2. Investigate solubilities.
3. Investigate heats of neutralizations.
4. Investigate re-dox cells.
5. Investigate electrolysis.
6. **Investigate Reactions**

* Chemical reactions are changes of chemical structure that occur when two or more elements come into contact. There are four basic types of reactions: synthesis, decomposition, single replacement and double replacement. IB chemistry labs get students to initiate reactions using different materials. One idea for a lab is to have students create liquid eruptions using materials (such as diet cola and Mentos mint candies), then measure the strength of the eruption using a pressure meter (see Resource 1). DEMO lab. Not suitable for EE or IA.

1. **Investigate Acids and Basis**

* Acids and bases are substances that react with each other. Acids have a pH of less than 7, while bases have a pH of greater than 7. Since most aqeous solutions have an acid or base rating, and many high school labs have pH readers, it is easy to find materials for experiments with acids and bases. One project on acids and bases involves comparing the pH levels of urban lakes to those of rural lakes. To do this test, gather water samples and bring them back to the lab, the insert a ph reader in each sample. Not suitable for EE or IA unless student puts together an investigation.

1. **Investigate Kinetics**

* Kinetics is the study of movement and energy. Topics like reaction speeds, energy transfer rates and electricity are part of kinetics. A kinetics experiment can, for example, measure the speed of a chemical reaction by timing how long it takes for the reactants (end products of the reaction) to be formed. This experiment requires only containers, reaction materials and a timer.

1. **Investigate Organic Chemistry**

* Organic chemistry is the study of the chemical makeup of living things. Organic chemistry experiments involve carbon based compounds and hydrocarbons. One lab experiment that you can do with organic materials is to separate the constituent compounds of a larger organic compound. Many compounds can be broken down by exposing them to alcohol under controlled conditions. For example, benzoic acid and benzoin can be separated by exposing both to ethyl-alcohol and ion-exchange resin in a test tube.

10. Removing tarnish from silver objects (redox reactions)

11. Aspirin: Syntheses using less common approaches like microwaves, purification by melting point and TLC, kinetics of the hydrolysis of aspirin to salicylic acid under various conditions

* 1. Synthesis of the Sweetener Dulcin from the Analgesic Tylenol (allows using  titration)
  2. Thermal denaturation of proteins using UV light
  3. Thermodynamics and kinetics of 'Heater Meals"
  4. Investigating the kinetics of the bleaching of a dye using a colorimeter probe
  5. Solidification techniques and materials
  6. distribution constant of iodine between aqueous and non-aqueous systems
  7. Investigating gases in water overheated in a microwave
  8. investigating EDTA contents in shower cleaners
  9. Investigating  the dependence of overvoltage on the composition of a metal surface at which hydrogen discharge occurs, bubbles' lifetime' and IMF
  10. Low rank coal swelling with different solvents
  11. Pharmaceuticals from plants
  12. Investigating fluorescence using turmeric, B complex vitamins, minerals, household items.
  13. Iodine numbers of palm oil as compared to other cooking oils.
  14. An expansion of the determination of manganese in a paper clip.
  15. Effectiveness of different  salts on road snow removal.
  16. In-depth kinetics investigation into a specific investigation.
  17. Transition metal ions (effects of metals, ligands, oxidation states on the colour of the ion)
  18. Natural indicators (sources, stability, Ka values, end point range)

30. Extraction of oil from spices (using different sources of spices, different storage conditions)

31. Effectiveness of different water purification methods on dissolved ions.

32. Melting points of group 2 metals and the different types of crystal lattice.

33. The amount of nitrogen in fertilizers (reacting with excess NaOH and titrating with standard HCl)

34. Thermodynamic data for ionic compounds (Ksp, can be calculated by gravimetric determination, The enthalpy of solution)

35. The use of different fruits to chelate heavy metals (eg cadmium) from polluted water sources.

36. The effect of temperature on vitamin C content in red pepper juice.

37. Determination of residual chlorine concentration vs distance from water treatment plant

38. The determination of the activation energy in a reaction by examining the relationship between temperature and the rate constant of said reaction.

39. The effect of cooking method on Vitamin C content

40. Henna as an effective indicator

41. Free caffeine in coffee vs various teas

42. Effect of roasting on caffeine content of coffee

43. Ca content of lentils

44. Change of [Fe] in avocados as they ripen