Organic chemistry assignment

Organic chemistry could be regarded as the chemistry of life. Organic Chemistry is of great medical, economic and technological importance. It touches almost every areas of our daily life (food, medicinal drugs, paper, ink, paint, plastic, fuel, textiles, pesticides, dyes, explosives, etc). Living organisms are nature’s laboratory where many chemical transformations are taking place independently, simultaneously and continuously. Hence most organic sample are mixtures of compounds.

However, the need for identification of these numerous compounds of carbon had led to their division into groups/family based on some of their common features. One f the major questions requiring on answer In organic Chemistry and Chemistry In general Is what is present in a given sample of material. These will often Involve determining the class of the compounds and the arrangement of atoms In the molecules I. E. The structure of the compound(s).

The correct answer to these question and many more will help to come up with the Identity of the compound(s) In the sample. A) Ability of carbon to form bonds not only with other elements but also with itself. B) The existence of different types of isomeric compounds The basic structure of any organic compound be it plastic, protein, medicine or fuel insist of a skeleton of carbon atoms Joined together in chains and rings. This ability of an element to form chains of atoms bonded together is known as catenation. Season for having for having four elements establishing 4 covalent bonds around a carbon atom. Isolation and Purification of Organic compounds The goal of preparative organic chemistry is the isolation of pure materials. These products are either crystalline or liquid, less often gaseous. A pure

sample is made up, as far as attainable, of only one kind of molecule; it not possible for it to be significantly purified any further by other operations.

The most common operation tit which the student taking this course at this stage may be confronted during his laboratory practices, may involve the isolation and purification of the products of an organic reaction. Chemical reactions which involve interactions between ions, as is often the case in inorganic reactions, are generally quantitative. A reaction is said to be quantitative if the weight of the product expected from psychometric equation representing the reaction is obtained.

On the other hand, reactions between molecules containing predominately covalent bonds, more often the case in organic reactions are generally slower than ionic sections and are usually not quantitative. These reactions are slower than ionic reactions because they involve breaking and formation of covalent bonds- processes which require more activation energy than spontaneous interactions between oppositely charged ions. They are not usually quantitative because side reactions take place, yielding by-products.

Since the reaction mixture now consists of the unrelated starting material, the undesired products of side reactions and desired reaction products. The problem is therefore introduced of having to isolate the desired product from the mixture as well as purifying it. Example, propane is prepared by the oxidation of propane-l-OLL with K Car 07 . In this preparation, the desired reaction product, propane (which is a liquid) has to separated from other products of side reactions such as propane acid, and unrelated starting materials such as propane-l-OLL and K Car 07. * CHOUGH (0) The method of

isolation and purification to be adopted will depend on the nature of the desired product relative to that of the contaminants. A) Solid products contaminants by filtration, and purified further by crystallization or fractional crystallization if insoluble contaminant separates with the product. Should difficulties arise in the isolation of solid products, an indirect method which is known as solvent extraction can be employed.

Solvent extraction is based on the principle of distribution of a solute between two immiscible solvents. Note, the more polar a solvent is the greater is its tendency to dissolve compounds containing polar covalent bonds and ionic bonds; the less polar it is the greater its tendency to dissolve compounds containing predominately covalent bonds which are either non-polar or weakly polar. The products gotten via this route is purified by crystallization. The resealing product is therefore more likely to be free of contaminants than the amorphous product.

We might however be warned that compounds which have similar molecular structures tend to crystallites out together. Such compounds are said to be isomorphism. B) Liquid products The conventional method of isolation and purification is distillation. If any of the contaminants also happen to be a liquid, then fractional distillation will have to be adopted. The practice of distillation depend on the fact that a pure liquid has a definite boiling point at a given pressure and should therefore distill off in a pure state at this imperative and pressure.

For example, in the preparation of propane by the controlled oxidation of propane, the allayed is separated by simple distillation from the other

compounds of the reaction mixture. In a situation whereby a contaminant forms a constant boiling mixture with the reaction product the process of isolation and purification by distillation becomes difficult, e. G. Alcohol and benzene are to be distilled from an aqueous solution. In such a case effective fractional techniques have to be used. Solvent extraction technique can be used in this case. Chromatography This is a separation technique [pick]