



Extraction, Estimation and Study of Caffeine from different Tea Samples

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*The active ingredient that makes tea and coffee valuable to humans is Caffeine which is an alkaloid. Caffeine is found in sixty plant species. It belongs to family of naturally occurring compounds known as xanthenes. In humans, caffeine acts to stimulate the heart, nervous system and the respiratory system. Blood pressure is increased by its use, since heart rate is increased. It is diuretic and has the effect of delaying fatigue. It has bitter taste but no smell. High caffeine consumption in pregnant women leads to the malformation of their children. The various tea samples used for the experiment were gathered from different areas of Patna. The aim behind the experiment was to carry out extraction of an aqueous solution of tea with an organic solvent, and to isolate caffeine from different tea samples. This was a simple-seeming experiment, which in fact made use of a number of rather advanced chemical processes. To isolate it from tea samples caffeine was chemically separated from the rest of the tea solution, by the process is known as extraction. It is a chemical method of separating a specific component of a solution from rest of the solution. This was done by using dichloromethane in which caffeine is very soluble, while the rest of the tea solutions were not as soluble. The Procedure included weighing of six different varieties of tea samples for approximately 30 g which was further transferred into six different 500ml beakers. 250ml of distilled water was added with the help of a measuring cylinder and then 5g of sodium carbonate was added to each flask. The mixture was then stirred with a glass rod. The contents of the beaker were boiled on a hot water bath for approximately 10 minutes and then cooled to room temperature using ice water-bath. The cooled solutions were filtered using glass wool. The filtrates so formed were transferred into separating funnel and were extracted for four times using (4*10ml) dichloromethane. After each extraction, the lower organic layers were then transferred into 250 ml beakers. The filtrates were then evaporated to dryness on water bath. The residue obtained was caffeine which was slight green in colour. For the calculation of percentage of caffeine in each tea sample the weight of caffeine with the watch glass was noted and then after transferring caffeine to another beaker, the weight of empty dry watch glasses were also noted. From the above process we were able to calculate the weight of caffeine in each tea samples and further we calculated the percentage of caffeine in the respective tea samples. It was found that Tata Tea Gold contains the maximum while the loose gol dana sample contains the minimum percentage of caffeine.*

Keywords:- Caffeine and tea.