Dr. BRR. GOVERNMENT COLLEGE, JADCHERLA, MAHABUBNAGAR (Dist.)

Student Study Project

2021 -22

DEPARTMENT OF CHEMISTRY

Topic

DETERMINATION OF CAFFEINE IN TEA SAMPLES

Conducted by students

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Introduction:

Aim

To Determine Caffeine In Tea Samples.

Tea is the most commonly and widely used soft beverage in the household. It acts as a stimulant for central nervous system and skeletal muscles. That is why tea removes fatigue, tiredness and headache. It also increases the capacity of thinking. It is also used for lowering body temperature.

The principal constituent of tea, which is responsible for all these properties, is the alkaloid-caffeine. The amount of caffeine in tea leavers varies from sample to sample. Originally it was thought that caffeine is responsible for the taste and flavour of tea. But pure caffeine has been found to be a tasteless while substance. Therefore, the taste and flavour of tea is due to some other substance present in it. There is a little doubt that the popularity of the xanthenes beverages depends on their stimulant action, although most people are unaware of any stimulation. The degree to which an individual is stimulated by given amount of caffeine varies from individual to individual.

For example, some people boast their ability to drink several cups of coffee in evening and yet sleep like a long, on the other hand there are people who are so sensitive to caffeine that even a single cup of coffee will cause a response boarding on the toxic. The xanthene beverages also create a medical problem. They are dietary of a stimulant of the CNS. Often the physicians face the question whether to deny caffeine containing beverages to patients or not. In fact children are more susceptible than adults to excitation by xanthenes. For this reason, tea and coffee should be excluded from their diet. Even cocoa is of Determination of Caffeine in Tea Samples Ankit Bahuguna (XII-A) doubtful value. It has a high tannin content

may be as high as 50 mg per cup. After all our main stress is on the presence of caffeine in xanthene beverages and so in this project we will study and observe the quantity of caffeine varying in different samples of tea leaves..

Uses of Caffeine:

1. In medicine, it is used to stimulate, central nervous system and to increase flow of urine.

2. Because of its stimulating effects, caffeine has been used to relieve fatigue. But it is dangerous and one may collapse if not consumes it under certain limit.

3. Caffeine is also used in analgesic tablets, as it is believed to be a pain reliever. It is also beneficial in migraines..

Effects of Caffeine:-

1. It is psycho - stimulant.

2. It improves physical and mental ability.

3. Its effect in learning is doubtful but intellectual performance may improve where it has been used to reduce fatigue or boredom.

4. When administered internally, it stimulates heart and nervous system and also acts as diuretic. On the contrary their excessive use is harmful to digestion and their long use leads to mental retardation .

Procedure

First of all, 50 grams of tea leaves were taken as sample and 150 ml of water was added to it in a beaker.

Then the beaker was heated up to extreme boiling.

The solution was filtered and lead acetate was added to the filtrate, leading to the formation of a curdy brown coloured precipitate.

We kept on adding lead acetate till no more precipitate has been formed.

Again solution was filtered.

Now the filtrate so obtained was heated until it had become 50 ml.

Then the solution left was allowed to cool.

After that, 20 ml. of chloroform was added to it.

Soon after, two layers appeared in the separating funnel.

The residue left behind was caffeine.

Then we weighed it and recorded the observations.

Similar procedure was performed with different samples of tealeaves and quantity of caffeine was observed in them.

Observation Table

1. Red Label Tea (Brooke Bond)

Weight of china dish	46.60 gms
Weight of china dish with precipitate	47.20gms

Amount of Caffeine	0.60gms

2. Yellow Label Tea (Lipton)

Weight of china dish	46.60 gms
Weight of china dish with precipitate	47.15gms
Amount of Caffeine	0.55gms

3. Green Label Tea (Lipton)

Weight of china dish	46.60 gms
Weight of china dish with precipitate	47.05gms
Amount of Caffeine	0.45gms

Conclusion

1. Quantity of caffeine in Red label tea is 60mg. /sample of 50 gm.

2. Quantity of caffeine in yellow label tea is 55mg./sample of 50 gm.

3. Quantity of caffeine in green label tea is 45mg./sample of 50 gm..