Tea project essay sample

Science, Chemistry



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INTRODUCTION

Tea is made from the young leaves and buds of the tea plant. Tea leaves are rich in caffeine (an alkaloid). Besides caffeine, tea leaves also contain tannic acid and coloring matter, such as polyphenolic compounds. The relative amounts of these substances are different in different varieties of tea leaves, which is why, their tastes and flavours are different.

The brownish color of the tea is due to the presence of polyphenolic compounds and some organic ions like Mn+2, Fe+3, etc. Some simple experiments can be carried out to study the components that are responsible for the variation in tea flavour in various brands of tea.

EXPERIMENT – I

AIM: Compare the water soluble polyphenol (catechin) content in various samples of tea leaves.

REQUIREMENTS: Beakers, conical flasks, funnels, heating arrangement, tea bags of different brands of tea.

THEORY: Tea contains upto 30% of the water soluble polyphenols (catechin). These are largely responsible for the flavour of the tea. To estimate the extent of these compounds in a given sample, the tea leaves are immersed in hot water for equal time and the loss in weight of tea leaves is determined.

PROCEDURE:

1. Weigh exactly 3 g of each of the different samples of tea and place them in tea bags. 2. Take three or four conical flasks and put 100 ml of hot water into each of them. 3. Put tea bags of different samples of tea in the different conical flasks. After 10 minutes, remove the tea bags and dry them by placing them in an oven. 4. When the tea bags become dry, reweigh them.

AIM: Compare the tannic acid content of various samples of tea.

REQUIREMENTS: Beakers, conical flasks, funnels, heating arrangement, various samples of tea, calcium carbonate, conc. HCl.

THEORY: The tannic acid present in tea leaves is precipitated as calcium tannate by treatment of aqueous solution of tea with calcium carbonate. Calcium tannate is then hydrolyzed with conc. HCl and recrystallised from water.

PROCEDURE:

1. Weigh 10g of each of the given samples of tea leaves.

2. Take 100 ml of distilled water in a 400 ml of beaker and boil it. Then add the first sample of tea leaves to it and boil it for 10 minutes. Cool and filter the solution. 3. To the filtrate, add about 2g of solid calcium carbonate and boil the contents. Tannic acid gets precipitated as calcium tannate. Separate the precipitate of calcium tannate by filtration. 4. Calcium tannate obtained is hydrolyzed by warming with 4-5ml of conc. HCl. The tannic acid obtained is crystallized from water and weighed. 5. Repeat the steps 2, 3 and 4 with the other samples of tea and recode the observations.

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