

QUANTITATIVE ESTIMATION OF FORMALDEHYDE FOR SAFETY ASSESSMENT OF SANITARY NAPKINS.

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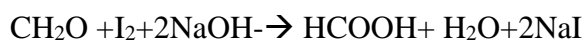
Abstract: A sanitary napkin is a feminine hygiene product. It is made up of absorbent materials which are arranged in different layers. In olden days women have faced a lot of problem regarding their periods, use of sanitary napkins have made their life a lot easy. Though sanitary napkins have made the life easy but come with certain kinds of safety concern. According to reports feminine care industry has been known to use certain toxic chemicals which are carcinogenic in nature. Formaldehyde is one of them. According to the American cancer society safe quantity of formaldehyde should be less than 100 ppm that touches the skin. This experiment deals with Quantitative estimation of formaldehyde for safety assessment of sanitary napkins. The experimental method used is iodometric titrations. It was found that amount of formaldehyde per sanitary napkin is under safe quantity, but it does not remain safe anymore when we look at the total number of sanitary napkins used per cycle. Normally a woman uses 14-16 napkins per cycle, therefore the study raises a lot of concern against the use of formaldehyde in sanitary napkins.

Keywords :- Hygiene Product, Formaldehyde, Iodometric titrations, Sanitary Napkins.

Introduction: - A sanitary napkin is a feminine hygiene product. It is made up of an absorbent material which is arranged in layers. Sanitary napkin is considered as a medical grade product so the manufacturers are not bound to give the exact composition of their product. Sanitary napkins have made the life of women a lot easier but at the same time it has brought some safety concerns. According to reports the feminine care industries have been found using some products which are potentially harmful for the females using them. They contain different kinds of toxic chemicals which are carcinogenic to humans. One of them is formaldehyde. According to international agency for research on cancer formaldehyde is a human carcinogen and it is reported in its 12th report on carcinogens. On an average a woman uses 10 sanitary napkins in one menstrual cycle. These napkins are considered as a ticking time bomb due to years of exposure, chemicals on your skin may be worse than eating them, when such chemicals touch your skin they straight forward enter your bloodstream. Formaldehyde is a colourless, strong-smelling gas used in making building

materials and many household products. It is used in pressed-wood products, such as particleboard, plywood, and fibre board; glues and adhesives; permanent-press fabrics; paper product coatings; and certain insulation materials. It is also used to make other chemicals. Exposure to formaldehyde has been shown to cause cancer in laboratory test animals. Exposure to relatively high amounts of formaldehyde in medical and occupational settings has been linked to some types of cancer in humans. In rats, inhaled formaldehyde was linked to cancers of the nasal cavity and leukemia. In one study of rats given drinking water containing formaldehyde there was an increase in stomach tumors, while another showed no increase in any kind of tumor or cancer. In mice, applying a 10% solution of formaldehyde to the skin was linked to quicker development of cancers caused by another chemical.

Methodology: There are various methods of quantitative formaldehyde estimation, hypo iodite solution which oxidises formaldehyde quantitatively into formic acid.



In actual practice excess of iodine solution is added in presence of NaOH and after reaction is over unused I₂ is titrated back against N/10 sodium thio sulphate solution using starch as indicator.

The sanitary pads of different brands were kept in water for about 6 hours the water sample was then titrated and the quantity of formaldehyde was also calculated for sterile and distilled water sample was used as control. Standard formaldehyde solution was also used sample means and standard mean was calculated and stastical unpaired t test was applied at 5% level of significance.

Data and Analysis:

S.No	BRAND/SAMPLE	VOL OF Na ₂ S ₂ O ₃	% OF CHO	ACTUAL % CHO
1	STANDARD	4	.48	.28
2	WATER	60.4	.20	0
3	BRAND 1	35	.33	.13
4	BRAND 2	50	.25	.05
5	BRAND 3	52	.24	.04
6	BRAND 4	50	.25	.05
7	BRAND 5	32.5	.34	.17
8	BRAND 6	43	.29	.09
9	BRAND 7	19	.41	.21
10	BRAND 8	43	.29	.09

The mean value for different brands came out to be 0.105 a statistical unpaired t test was applied to check the difference between the standard and the sample mean and a significant difference was found between the standard and sample mean.

Conclusion: According to the American Cancer Society safe quantity of formaldehyde should be less than 100 ppm (1 ppm=0.001 g/kg) that touches the skin is recommended. Normally a woman uses 10-14 napkins per menstrual cycle this can vary from person to person. Although the amount of formaldehyde is under safe quantity but it shows it does not remain safe anymore when we look at the total number of sanitary napkins used per cycle.

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