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STUDY OF COATED UNCOATED TABLETS AND ITS DISINTEGRATION CHARACTERISTICS

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ABSTRACT

Tablets are pharmaceutical solid dosage forms usually obtained by single or multiple compressions of powders or granules. Certain tablets may be obtained by moulding or extrusion techniques. This study was carried out to assess the behavior of Coated, uncoated tablets i.e. Thickness, breaking strength, disintegration time, swelling index. The disintegration time of the coated and uncoated tablets in the media used was pH dependent. Coated and uncoated tablets have faster disintegration in distilled water (pH 7.0) than phosphate buffer (pH 6.8) & 0.1M HCl (pH 1.5) in which uncoated tablets faster disintegrates than coated tablets.

KEYWORDS : *Coated tablets (CS_1, CS_2, CS_3), Uncoated tablets (US_1, US_2, US_3), disintegration, pH, Phosphate buffer, ODTS, dissolution, U.V. etc.*

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INTRODUCTION

Tablets are solid dosage obtained by single or multiple compressions of powders or granules. They are coated or uncoated [1]. Coated tablets are tablets covered with one or more layers of mixtures of various substances such as natural or synthetic resins, polymers, gums, fillers, sugars, waxes. The coating may also contain medicaments [2]. Uncoated tablets are made in such a way that the release of active ingredients is unmodified. A broken section when examined under a lens, shows either a relatively uniform texture (single-layer tablets) or a stratified texture (multi-layer tablets), but no signs of coating. Tablets for use in the mouth are usually uncoated. They are usually formulated to effect a slow release and local action of the active ingredient(s) [1]. Disintegrates are agents added to tablets formulation to promote the breakup of the tablet 'slugs' into smaller fragment in an aqueous environment there by increasing the available surface area and promoting a more rapid release of the drug substance. Disintegrants are an essential to disintegration function. Although not all effective disintegrants swell in contact with water. Swelling is believed to be a mechanism in which certain disintegrating agents impart the disintegrating effect, by swelling in contact with water. The adhesiveness of other ingredients in tablets is overcome causing the tablets to fall apart. Drug

release in pH 6.8 phosphate buffers was faster than in 0.1M HCl solution [3]. ODTs disintegrated rapidly and dissolve in mouth without chewing or additional water intake [4]. Orally fast disintegrating tablets, which do not require water to aid swallowing [(5)].

MATERIALS AND METHODS

The materials used were formulated coated antimalarial tablets & uncoated analgesic tablets purchase from local market & identified by "Laboratory of Food & Drug Administration" Idgah Hills, Bhopal (M.P).

Assay %

Weigh and powder of 20 tablets. A quantity of the powder equivalent to about 150 mg of the tablets. Add 50 ml of 0.1M sodium hydroxide. Dilute with 100 ml of water. Shake for 15 minutes and add sufficient water to produce 200.0 ml. mix, filter and dilute 10.0 ml of the filtrate to 100 ml with water. To 10.0 ml of the resulting solution add 10.0 ml of 0.1M sodium hydroxide, dilute to 100.0 ml with water and mix. Measure the absorbance of the resulting solution at the maximum at about 257 nm [(6)].

Sulphated ash %

Heat a silica crucible to redness for 10 minutes; allow to cool in a desiccators and weight. Transfer to the crucible 1g of the substance being examined and weigh the crucible and the contents accurately. Ignite, gently at first, until the substance is thoroughly charred, cool, moisten the residue with 1ml of sulphuric acid, heat gently until the white fumes are no longer evolved and ignite at 800 25°[(7)].

Melting point

Extract a quantity of the powdered tablets containing 25mg of chloroquine phosphate with 20ml of water, filter and to the filtrate add 8ml of picric acid solution. The precipitate, after washing successively with water, ethanol (95%) and ether melts at about 207°

(a)Dissolution coated tablets

(i) Medium. 900ml of 0.1M HCl.
(ii) Speed-75 rpm
(iii) Time- 45minuts.

Withdraw a suitable volume of the medium and filter promptly through a membrane filter disc with an average pore diameter not greater than 1.0 um. Measure the absorbance of the resulting solution of the about 344 nm [(8)].

(b)Dissolution Uncoated tablets

(i) Medium. 900ml of Phosphate buffer pH 7.8
(ii) Speed-50 rpm
(iii) Time- 30minuts

Withdraw a suitable volume of the sample and filter promptly through a membrane filter disc with an average pore diameter not greater than 1.0um. Measure the absorbance of the resulting solution of the about 243 nm [(9)].

Phosphate test

2 ml of the prescribed solution add 2 ml of dilute nitric acid and 4 ml of ammonium molybdate solution and warm the solution a bright yellow precipitate is formed.

Sodium test

Dissolve 0.1g of the $\pm$ substance being examined in 2ml of water being of water. Add 2ml of a 15% w/v solution of potassium carbonate and heat to boiling no precipitate is produced, add 4ml of a freshly prepared potassium antimonate solution and heat to boiling. Allow to cool in ice and if necessary scratch the inside of the test-tube with a glass rod a dense, white precipitate is formed [(10)].

Table: I Analytical data of coated and uncoated tablets.

Coated tablets	**% of assay**	**% of Sulphated ash**	**M.P.**	**% of Dissolution**	**Phosphate test**
CS_1	96.06	1.19	207.0˚	93.60	Present
CS_2	96.34	1.19	207.4˚	92.70	Present
CS_3	103.72	1.29	208.7°	90.50	Present
Uncoated tablets	**% of assay**	**% of Sulphated ash**	**M.P.**	**% of Dissolution**	**Sodium test**
US_1	98.25	1.98	170.0˚	94.73	Present
US_2	96.15	0.89	169.4˚	95.20	Present
US_3	101.4	1.29	171.8˚	91.56	Present

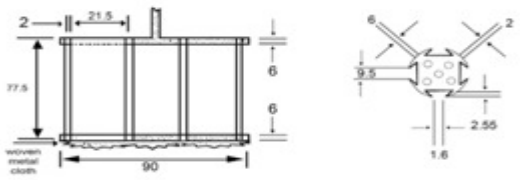
Disintegration: -

Disintegration is a state in which no residue of the tablets remains on the screen of the apparatus. This test determines whether tablets disintegrate within a prescribed when placed in a liquid medium under the prescribed experimental conditions. The disintegration times of the tablets were determined. The assembly is suspended in the liquid medium in a suitable vessel, preferably a 1000 ml beaker. The volume of liquid is such that the wire mesh at its highest point is at least 25 mm below the surface of the liquid, and at its lower point is at least 25mm above the bottom of the beaker. A thermostatic arrangement for heating the liquid and maintaining the temperature at 37° 2˚ $\pm$

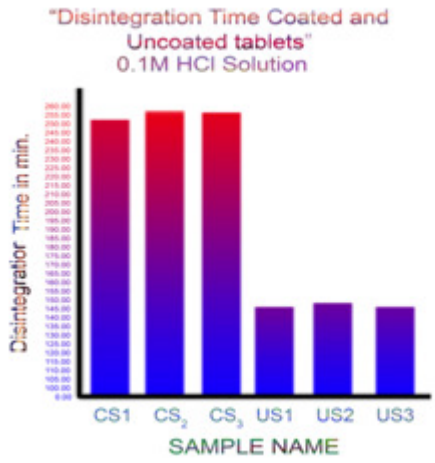
Table: II disintegration time coated and uncoated tablets.

S.No.	**Samples**	**Disintegration time (min)**		
		A	**B**	**C**
1	CS_1	251.40	14.49	10.10
2	CS_2	257.23	19.46	10.21
3	CS_3	256.18	17.19	10.23
4	US_1	145.20	14.19	08.57
5	US_2	148.17	14.27	08.59
6	US_3	145.20	14.44	09.10

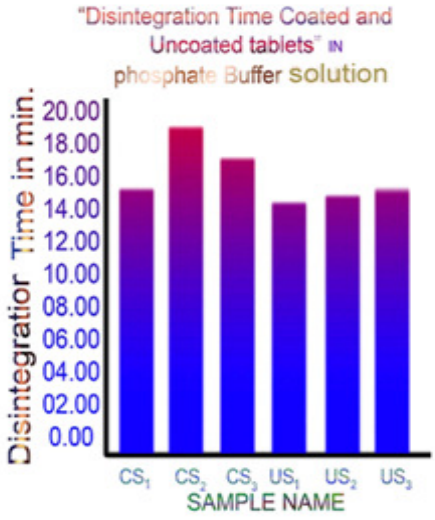
A = 0.1 M HCl (pH 1.5) solution; B = pH 6.8 phosphate buffer solution; C = distilled water.



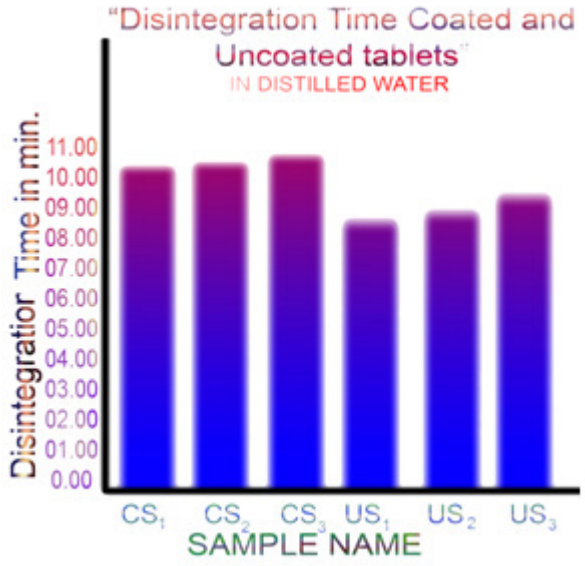
APPARATUS FOR DISINTEGRATION OF TABLETS[11]



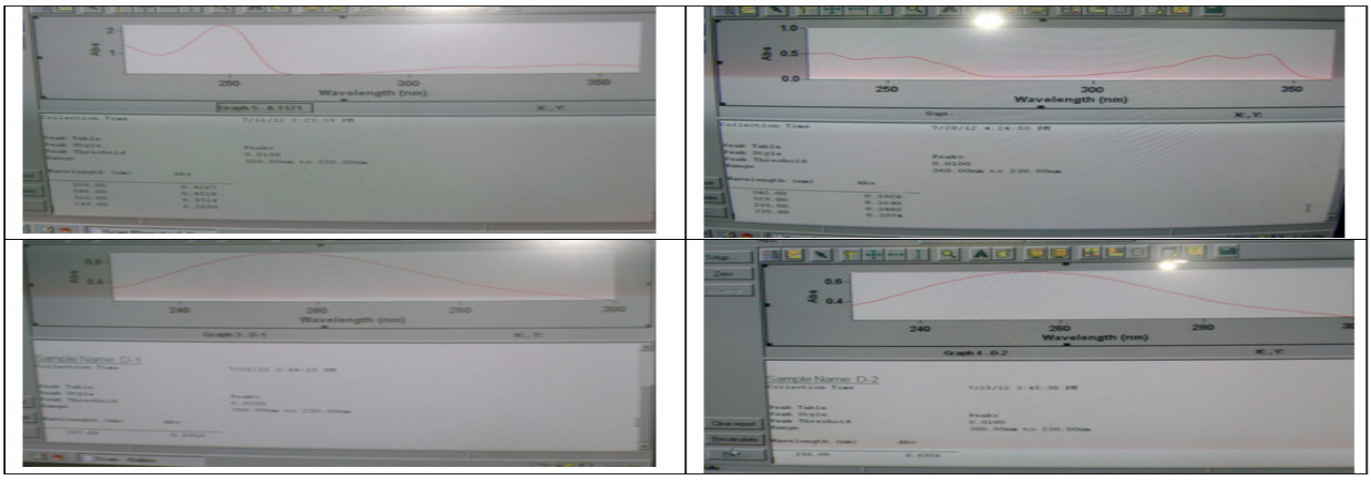
GRAPH OF DISINTEGRATION TIME OF COATED AND UNCOATED TABLETS IN 0.1M HCl SOLUTION



GRAPH OF DISINTEGRATION TIME OF COATED AND UNCOATED TABLETS IN PHOSPHATE BUFFER



GRAPH OF DISINTEGRATION TIME OF COATED AND UNCOATED TABLETS IN DISTILLED WATER



RESULT AND DISCUSSION:

The formulated coated and uncoated sample's was asses to study. The results showing in table-I indicating % of assay 96.064%,96.338%,103.72%, % Sulphated ash 1.19%,1.197%,1.29%, M.P. 207°C,207.4°C,208.7°C, % dissolution 93.6%,92.7%, 90.5%, Phosphate test present respectively in samples CS_1, CS_2, CS_3 and % of assay 98.25%,96.15%,101.4%, % Sulphated ash 1.98%, 1.89%,1.29%, M.P. 170°C,169.4°C,171.8°C, % dissolution 94.73%,95.20%,91.56% and sodium test present respectively in samples US_1, US_2, US_3.

Table-II showing disintegrating time of the coated and uncoated tablets in the three media used follow the order 0.1M HCl > Phosphate buffer > Distilled water. The disintegration times for coated tablets in media 'A' 251.40, 257.23, 256.18, in media 'B' 14.49,19.46,17.19, in media 'C' 10.10,1021,10.23 & disintegration time for Uncoated samples in media 'A' 145.20,148.17,145.20, in media 'B' 14.19,14.27,14.44, in media 'C' 8.57,08.59,09.10, respectively indicating disintegration of uncoated tablets faster than coated tablets in the media distilled water.

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