

Paracetamol Tablets IP

Experiment No. 2

Date:

Aim : To prepare and submit 50 paracetamol tablets IP, each containing 500 mg of paracetamol.

Synonym : Acetaminophen tablets.

Formula : As per IP

Ingredients	Official formula	Working formula
Paracetamol	0.500 g (500mg)	
Starch powder, 5%	0.025 g (25mg)	
Starch paste, 10%	q.s.	
Talc, 2%	q.s.	

Note : The working formula is calculated for 60 tablets. Extra 10 tablets are required to account for the production losses.

Manufacturer's Definition : Paracetamol tablets are uncoated, white or off white coloured, flat faced, round tablets having a diameter of _____ mm and thickness of _____ mm.

However different manufacturers produce paracetamol tablets of different shapes.

Standards (IP) : Paracetamol tablets contain not less than 95.0 per cent and not more than 105.0 per cent of the stated amount of paracetamol, $C_8H_9NO_2$.

Usual Strengths (IP) : 300 mg, 500 mg.

Type : Heterogeneous powders—solid.

Theory

Paracetamol tablets are commonly used as analgesics and antipyretics. Starch powder acts as a disintegration agent. Starch paste acts as binding agent. Talc is used as glidant. The dose (bulk) of paracetamol is sufficiently high to compress in the die. Hence diluent is not required. Paracetamol is not susceptible to moisture and temperature. Therefore wet granulation method is suitable for granulation.

Apparatus and Chemicals

Mortar and pestle	1	Paracetamol
Measuring cylinder, 100 ml	1	Starch powder
Beaker, 100 ml	1	Talc
Watch glass	1	
Sieves 10, 22, 44, 60	1 Set	
Dryer	1	
Compression machine	1	

Procedure

Depending on the number of tablets to be submitted, the working formula is calculated. A flow sheet for the manufacture of paracetamol tablets is prepared.

Preparation of granulating medium (10% starch paste) : Ten g of starch is weighed and transferred into a beaker (250 ml). Fifty ml of water is added into the beaker and slurry is prepared by stirring with a glass rod. Twenty-five ml of water is added and the beaker is placed on a wire gauge. The slurry is heated with Bunsen burner to obtain a thick paste. Remaining 25 ml of water is added and stirred well. Heating is stopped and the starch paste is cooled.

Sifting of powders : Desired quantities of paracetamol and starch powders are weighed as per the working formula. These powders are passed through 60-mesh sieve.

Blending of powders : The sifted powders are mixed thoroughly in mortar with pestle until uniform blend is obtained.

Wet granulation (wet screening) : A small quantity of granulating medium is taken into a watch glass and weighed (A g). From this, little quantities of granulating medium are transferred to the mortar containing powders and triturated. This procedure is continued until smooth dough is formed. The end point to stop adding granulating medium is decided by the following test.

Test	Observation	Inference
The wet mass is taken into hand and a round ball is made. It is pressed in the palm with the thumb.	The ball crumbles under moderate pressure without giving fines.	Stop adding granulating medium. The mass is ready for wet screening.
	The ball breaks forming many fines.	Continue adding granulating medium.

The wet mass is passed through 10-mesh sieve in a tray. This process breaks wet mass forming wet granules. Wet granules surface area is more so drying will be effective. Wet granules are spread in the tray.

Drying : The granulating medium left in the watch glass is weighed (B g). The tray containing granules is placed in a hot-air oven and the temperature is adjusted at 70°C. Drying is continued until the moisture content of granules is reduced to about 6%. (This can be done by taking a sample of granules and measuring the moisture content using Cenco Moisture Balance consisting of IR lamp). The oven is switched off and the granules are allowed to reach room temperature.

Dry screening : The total granules are weighed (G g). The dry granules are passed through 22/44-mesh sieves completely. The granules that are retained on 44-mesh sieve are weighed (H g). These are coarse granules. The granules that are passed through 44-mesh sieve (and collected in a tray) are weighed (I g). These are termed as fines. Percentage fines formed are calculated.

Dry blending : Fifteen per cent fines are calculated and weighed (J or I g). These fines are added to the coarse granules. The required quantity of talc is added. The ingredients are blended in order to get a uniform distribution of ingredients. Now the granules are ready for compression.

Compression : Three packets of granules, containing the practical weight of one tablet, are prepared. These are used to adjust the pressure of the punches in order to get tablets of sufficient hardness. The remaining granules are compressed to obtain tablets.

The production yield is calculated using the formula.

Packing : Compressed tablets are placed in wide-mouthed, light-resistant container. The container is capped and cleaned.

Labelling : Appropriate label is prepared and fixed to the container.

Composition : Each tablet contains 500 mg of paracetamol.

Category : Analgesic, antipyretic.

Dose : 500 mg to 1 g every 4 to 6 hours, up to 4 g daily, in divided doses.

Storage : Store in a well-closed container.

Auxiliary Label : Swallow a tablet with a glass of drinking water.

Date of Expiry : 24 months from the date of manufacture.

Production Yield :

In-process Quality Control :

1. Diameter
2. Thickness
3. Weight variation
4. Hardness
5. Friability
6. Disintegration time

Report :

QUESTION BANK

1. Why is wet granulation technique preferred for paracetamol?
2. Calculate the ingredients required for the manufacture of 50,000 paracetamol tablets.
3. Draw a flow sheet for the manufacture of paracetamol tablets.
4. Why is the number of excipients less in the paracetamol tablets?
5. Why are paracetamol tablets produced by wet granulation?
6. What are the problems associated with the compression of paracetamol tablets? Suggest the remedial measures.
7. Give the reasons for monitoring the moisture content critically in the drying step of granulation.