

THE INCORPORATION AND RELEASE OF IMIPRAMINE FROM ALUMINA GEL SPHERES

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Alumina hydrogels are usually prepared by precipitation of an aluminium salt solution with a strong alkali solution, the gel can then be maintained in the wet state or dried to form a xerogel. The aluminium hydroxide produced can be amorphous or in one of several crystalline forms depending upon the precipitation conditions.

A process described by Dress and Grimes (1969) provides a method by which regular size spheres of nuclear fuel oxides can be produced. A modification of this process has been used to produce uniform spheres of aluminium hydroxide which contain imipramine.

A feed solution containing imipramine hydrochloride and a gelling agent in an aluminium salt solution was dropped into 0.880 ammonium hydroxide solution, from a dropping funnel, through a 2mm diameter nozzle. The liquid drops precipitated as separate opaque white spheres of aluminium hydroxide containing imipramine and maintained their individuality during all subsequent processes.

After standing in the ammonium hydroxide solution for at least one hour, the hydrogel spheres were filtered from the solution and subjected to various washing procedures before drying. All spheres were then allowed to dry at 20-25°C (room temperature) in open trays until no further change in weight occurred. The diameter of the spheres at this time was of the order of 2mm. Spheres were then subjected to a rotating bottle dissolution test in 50ml of 0.1N hydrochloric acid before and after any further heat treatment.

The results obtained (Table 1) indicate that both washing and heat treatment of the spheres determine the rate of release of drug from the spheres.

WASHING TREATMENT	NONE	1L WATER	6L WATER	NONE	1L WATER	6L WATER
HEAT TREATMENT	NONE	NONE	NONE	105°C/4h	105°C/4h	105°C/4h
TIME FOR 50% DRUG RELEASE (MINS).	12	12	20	36	147	≈ 650

Table 1: Release data for gel precipitated spheres subjected to various washing and heat treatments.

DRESS, W. and GRIMES, J.H. (1969) BRIT.PAT.No. 1,175,834.