

SOLUTHIN® MD H: A FAST-DISPERSIBLE HYDROGENATED PHOSPHOLIPID FORMULATION INCREASING THE DISSOLUTION OF POORLY SOLUBLE ACTIVES IN WATER

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Introduction:

The poor solubility of lipophilic compounds in water can be overcome by using hydrogenated phospholipids (HPLs) as solubilizers or wetting agents.¹ SOLUTHIN® MD H is a co-processed dry mixture of maltodextrin with pre-formed liposomes made from HPLs from non-GMO soybean with not less than 18 % hydrogenated soybean phosphatidylcholine (HSPC). A dry mixture of these lipids with an active could be useful for in-situ preparation of a dispersion medium for poorly water-soluble compounds.

Aims:

The purpose of the present work was to demonstrate the rapid dissolution of SOLUTHIN® MD H itself and its effect on the dissolution of a poorly soluble active (e.g. curcumin) in water or in a biorelevant medium simulating duodenal resorption.²

Methods:

HPLs with n.l.t. 62 % PC (LIPOID P 75-3) and SOLUTHIN® MD H (30 % HPLs and 70 % maltodextrin) were from Lipoid GmbH. All other substances applied were of analytical grade. Degrees of dispersion, filtration and dissolution were determined in supernatants after a sedimentation phase of 2–5 d using a moisture analyzer from Sartorius. 5.0 µm cellulose acetate syringe filters were also from Sartorius. Curcumin (*curcuma longa* extract) was detected visually on thin-layer chromatography (TLC) plates.

Results:

The degree of dispersion of HPLs in water after stirring of SOLUTHIN® MD H for 25 min at 600 rpm and 25 °C was found to be higher (90 %) than when dispersing the HPLs in a solid physical mixture with (49 %) or without (23 %) maltodextrin. Filtration yield of a SOLUTHIN® MD H dispersion through 5.0 µm membranes was 96 %. Degrees of dispersion of phospholipids after stirring times of 1.0, 2.5, 5.0 and 10 min were at 50, 90, 91 and 93 %, respectively, meaning that the powder was dispersed to a significant extent after stirring for ≥ 2.5 min. The concentration of curcumin (10 mg per size 1 capsule) in water at 25 °C and in biorelevant medium at 37 °C after stirring for 5–60 min and filtration through 5.0 µm was increased with SOLUTHIN® MD H as dispersant by a factor of >100 compared to microcrystalline cellulose as detected by TLC.

Conclusions:

The results show that SOLUTHIN® MD H nearly completely disperses in water after stirring for 2.5 min at 25 °C with significantly higher yields than its HPL component. It is effective in increasing the concentration of actives (e.g. curcumin) in the dispersant medium.

Keywords

Co-processed, liposomes, solubilisation, Curcumin