Poster LSH1

Coating Ibuprofen Nanoparticles with Eudragit by SAS Process

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Eudragit L polymers are widely used to protect your active from the gastric fluid and improve drug effectiveness due to is dissolved above pH 6.00. On the other hand the direct administration of ibuprofen cause irritation of the digestive tract, and could cause or aggravate pre-existing ulcers. So the coating of ibuprofen with this polymer would avoid possible gastric lesions. Moreover the drug absorption rate at therapeutic level could be enhanced significantly by reduction of the particle size. Conventional techniques have difficulty in controlling particle size during processing, high residual solvent concentration and /or thermal and chemical solute degradation. Supercritical fluid technology removes these drawbacks at the same time that provide a high quality product controlling the particle size and particle size distribution. In this work, particularly the supercritical antisolvent (SAS) process was carried out in order to prepare ibuprofen-eudragit systems. SAS process uses both the high power of supercritical fluids to dissolve the organic solvents and the low solubility of the drug and polymer in supercritical fluids to cause the precipitation of such compounds once they are dissolved in the organic phase. The experiments were carried out in a pilot plant developed by Thar Technologies (model SAS200). Pressures of 100-200 bar at temperatures of 40-50°C into the vessel and drug: polymer ratio of 1:1, 1:2, 1:3 and 1:5 were assayed. The rest operating conditions were held constants: CO_2 flow rate of 11 g/min, liquid solution flow rate of 5 mL/min, nozzle diameter of 100 μm and washing time of 90 min. All the experiments led to a successful precipitation of nanoparticles of ibuprofen and eudragit. Ibuprofen load was different according to the initial ratio between the drug and the polymer as it was expected: higher amount of ibuprofen in the initial drug: polymer ratio led to a higher ibuprofen load in the obtained systems. Particle size is increased four times when pressure goes from 100 to 200 bar. On the other hand, increasing temperature till 50°C led to higher particle size.