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AN INVESTIGATION INTO THE ROLE OF SURFACTANTS IN CONTROLLING PARTICLE SIZE OF POLYMERIC NANOCAPSULES CONTAINING PENICILLIN G IN DOUBLE EMULSION

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In this study, preparation, characterization and drug release behavior of loaded poly butyl adipate (PBA) nanocapsules with penicillin-G are described. The nanocapsules were produced using a double emulsion solvent evaporation technique, using dichloromethane as an organic solvent and tween and span as surfactants. In this process a mixture of glycerin and water was used instead of the traditional stabilizer system in the preparation of double emulsion. A water soluble drug is first dissolved in an aqueous solution, which is then emulsified in an organic solvent containing biodegradable polymer to make a primary w/o emulsion. Then this primary emulsion is added to a surfactant containing aqueous solution to form a w/o/w double emulsion. After removing organic solvent, the solid nanocapsules are left in the aqueous continuous phase and can be washed and centrifuged. The influence of surfactants on property of nanocapsules was discussed in detail. The effects of span and tween to modify the size of the nanocapsules were different. The mean diameters of penicillin G loaded nanocapsules ranged from 75 nm to 638 nm and were dependent on the types and content of the surfactants. The encapsulation efficiencies and drug release rates were also affected by the surfactants in the preparation process.