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High performance liquid chromatographic method for the determination of Rufinamide in tablets

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Rufinamide is an antiepileptic drug used as adjunctive treatment of seizures associated with Lennox-Gastaut syndrome in children 4 years and older and adults. Lennox-Gastaut syndrome consists of a variety of treatment-resistant seizures and is most common among paediatric patients. Rufinamide is chemically known as 1- [(2, 6-difluorophenyl) methyl]-1H-1,2,3-triazole-4 carboxamide with molecular formula $C_{10}H_8F_2N_4O$ and molecular weight 238.19 g/mol. An isocratic RP-HPLC method was proposed for the determination of Rufinamide in pharmaceutical formulations (Tablets). Isocratic elution was performed using water and acetonitrile as mobile phase. The overall run time was 10 min. and the flow rate of the mobile phase was 0.8 mL/min. with UV detection at 215 nm. 20 µL of sample was injected into the HPLC system. In the present work chromatographic separation was achieved by using a C-18 (250mm × 4.6mm i.d., 5 µm particle size) column of Shimadzu Model CBM-20A/20 Alite, equipped with SPD M20A prominence photodiode array detector, maintained at 25 °C. Linearity was observed in the concentration range of 1–200 µg/mL (R^2 = 0.9997) and the method was validated as per ICH guidelines. The RSD for intra-day and inter-day precision were found to be less than 2 %. The percentage recovery was in good agreement with the labeled amount in the pharmaceutical formulations and the method is simple, precise, accurate and robust for the determination of Rufinamide.

Biphasic drug delivery: A novel approach for zero order drug release

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The purpose of present study was to develop and optimize the Propranolol biphasic compressed tablet. Mini-tabs are small tablets with a diameter typically equal to or less than 3 mm can be filled into a capsule or further compressed into larger tablets. Generally, conventional controlled dosage forms delay the release of therapeutic system levels and do not provide rapid onset of action. When a single constant rate for drug release does not entirely satisfy the therapeutic objective, the quick/slow drug delivery system may be interesting alternative. A quick/slow release system provides an initial burst of drug release followed by constant rate of release over a defined period of time. This type of system is used primarily when maximum relief needs to be achieved quickly, and it is followed by a sustained release phase to avoid repeated administration. In this study on core tablet which was prepared using HPMC and Ethyl cellulose immediate layer which was prepared using Crosscarmalose sodium and Cross povidone were compressed. Prepared tablets were evaluated for physical properties. Formulations were also evaluated for XRD, FTIR and DSC to check any incompatibility. Drug content and in-vitro dissolution studies of biphasic tablet were carried out. Result showed that the immediate layer dissolved within 3 minutes and core tablet releases drug for 12 hrs in controlled manner with zero order release. Thus, study concluded with biphasic compressed tablet is suitable for zero order drug release with many advantages.

An integrated process for CO_2 sequestration from flue gas and lipid production for alternative fuels

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Nannochloropsis limnetica was studied for its ability to fix CO_2 from flue gas rich in CO_2 (10%) and low SOX concentration (40ppm). The species was capable of accumulating nearly 40% lipid (Tryglycerides) in its biomass. In the experimental batch studies, it was shown that the organism is capable of removing 90-80% of CO_2 from the flue gas fed into an indigenously build pneumatic bubble column reactor. The CO_2 removal was consistent with the growth of the organism however, the manifestation of CO_2 in the outlet enhanced with approaching stationary phase of the alga. The pH was maintained fairly constant above the neutral pH during entire batch study. In comparative analysis of total fatty acid profiles(TFA) between flue gas grown and control cultures, Gas chromatoraphy analysis showed an increase in oleic acid (from 13-33%TFA) and a decrease in linolenic and (15-6% TFA) and arachidic acids(22-16% of TFA) in flue gas grown cultures. Despite variation of the fatty acid profile, the total lipid content remained fairly constant in cultures grown under both conditions. The results showed a novel integrative process approach towards mitigation of CO_2 and biomass usage for alternative fuel production.