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A liposomal nanoparticle platform technology for the delivery oftaxanes - A case study

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The development of novel therapeutic candidates as well as some approved compounds faces the critical challenge of limited aqueous solubility, which results in reduced efficacy. Formulation strategies employed to deliver such compounds typically rely on the use of less desirable excipients such as ethanol, DMSO, cremophore, detergents etc. While these excipients improve solubility, they are toxic, often precipitates upon dilution *in vivo* or in vitro reducing the bioavailability. In many cases their use may result in undesirable side effects or sensitivities which reduce the therapeutic window and often require specific pre-treatment with other drugs. These formulations also require complicated steps and therefore more expensive manufacturing processes. Currently many liposomal and polymers nanoparticles are under investigation for drug deliver to overcome and solve the limitations of conventional drug delivery systems such as nonspecific bio-distribution, lack of aqueous solubility, poor oral bioavailability, and low therapeutic indices. The particle size and surface characteristics have been optimized to increase their circulation time in the bloodstream and to improve the safety, pharmacokinetics, and bio-distribution of drugs. Scientists at CuriRx, Inc. have developed a novel, liposomal nanoparticle platform technology for the delivery of such therapeutic compounds with not only better safety, efficacy, pharmacokinetics/pharmacodynamics profiles but also with easy scalable manufacturing process. A case study of development efforts of docetaxel encapsulated in the liposomal nanoparticle having significant clinical and manufacturing advantages over Taxotere: increased efficacy, improved pharmacokinetics, reduced toxicity, excellent stability, and enhanced solubility, will be presented.

Biography

Charan R Behl, PhD, is a consultant to CuriRx, Inc. and he is also engaged in the development of drug products including oral controlled release, transdermal, dermatological, parenteral, nasal, and ophthalmic drug products. He previously held executive positions at Elite Pharma, Northvale, NJ, and Nastec h Pharma, Hauppauge, NY; and senior positions at Roche, NJ. He got his PhD in Pharmaceutical Sciences from the University of Michigan, Ann Arbor, MI; MS in Pharmaceutical Chemistry from Duquesne University, Pittsburg, PA; and BPharm (Hons) from BITS, Pilani, India. He has, over the past 30+ years worked in the research and development of "challenging drugs". He has over 200 research articles, book chapters, and abstracts at major conferences; over 40 patents granted, under review, and in-preparation. He has co-organized many symposia working closely with colleagues from the academia, industry, the NIH, and the FDA. He is also a Fellow of the American Association of Pharmaceuticals Scientists (AAPS).

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Structural, dielectric and ferroelectric properties of PZT: CF Magnetoelectric composites

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Magnetoelectric (ME) materials possess both the magnetic and electrical properties simultaneously, thereby finding applications in a variety of devices. These materials are important not only from academic interest but from application point of view also. ME materials based on composites of ferroelectric and ferrimagnetic materials are attracting attention of researchers as there is a scope of improving their properties by playing with composition and by employing novel synthesis techniques. Composites of lead zirconatetitanate (PZT) and cobalt ferrite (CF) are among the most researched ME materials.

In the present paper, we are reporting the studies on structural, dielectric and ferroelectric properties of PZT and cobalt ferrite (CF) with representative formula $(1-x)PbZr_{0.55}Ti_{0.45}O3 + xCoFe_2O_4$, (x=0, 0.05, 0.10, 0.15 & 1.0 by weight). The samples were prepared by solid state reaction route. The constituent phases (PZT and CF) were synthesized separately, then mixed together and sintered. X-ray diffraction analysis confirmed the presence of individual constituent phases. The dielectric properties were studied as a function of frequency and as a function of temperature. To study the ferroelectric properties, P-E hysteresis loops were recorded. The detailed results shall be presented during the meet.

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