A New Method for the Formation of Liposome

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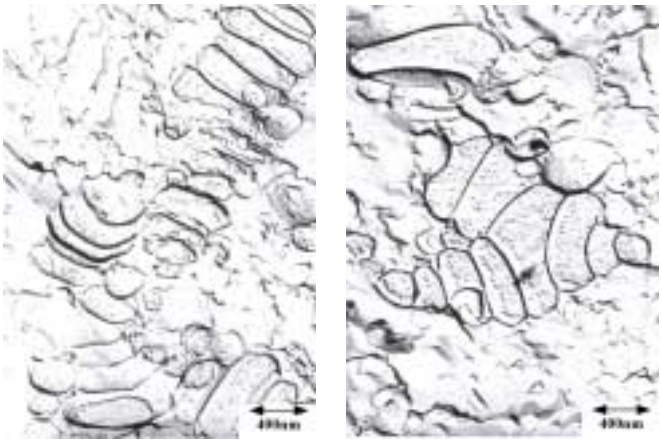
A new method for the preparation of liposomes in one step using supercritical carbon dioxide without any toxic organic solvents had developed. This method allowed to obtain aqueous dispersions of liposomes through emulsion formation by introduction of a given amount of water into a homogeneous mixture of supercritical carbon dioxide/L-a-dipalmitoylphosphatidylcholine/ethanol and subsequent pressure reduction. TEM observations using the freeze-replica method on the obtained vesicles revealed most of them are large unilamellar liposomes (LUV) with diameters 0.1-1.2μm. Trapping efficiency of the liposomes indicated more than five times higher trapping efficiency for the water-soluble solute than that of multilamellar vesicles (MLV) prepared by the Bangham method.



Typical freeze replica SEM images of liposomes.

Surface Modification using Plasma Based Ion Implantation

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A superimpose technique of RF power and high voltage pulses has been developed for Plasma Based Ion Implantation (PBII). The RF power generates plasma and ions in the plasma are implanted into specimens to modify the surface property. The features of this technique are high power efficiency, uniform distribution of ions over the specimens surface and simplicity of the apparatus. In this stage, nitridation of Ti and Cr and hard carbon coatings were performed using this technique.

Nitridation of a Ti-golf club head by the plasma ion implantation. The color after implantation is golden due to TiN formation