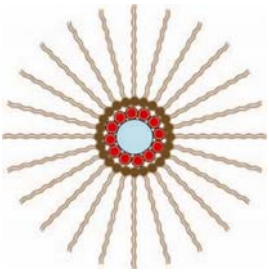
Natural Organic Products
Arbor Organics
207 Lithia Inn Road, Lincolnton, NC 28092 USA T. 732.867.5040 F. 732.867.5041

SiO_2 Matrix



Fine particle size silica particulates are widely used as the core substrate in a variety of delivery systems principally for their ease of use and generally recognized lack of toxicity. However, such particulates, in their natural form, do not show specific affinity to keratinous substrates such as skin, or living cells in general. It is well recognized that hydrophobic modification of silica particles through surface treatment will significantly improve cellular affinity[i],[ii],[iii],[iv],[v]. However, traditional surface modifications such as the various available silane treatments do not fit in well with the current market forces pushing for natural let alone organic products. To that end, we have developed a methodology where we immobilize actives on silica particulate (SiO_2) and then anneal an encapsulating layer of phospholipids so that the hydrophilic phosphate heads are oriented toward the silica core, leaving a hydrophobic domain exposed. This particular delivery system shows a great deal of utility in addressing the entrapment of hydrophilic or hydrophobic actives while being Certified Organic (>95%) through the USDA National Organic Program.

---

[i] Septinus, M., T. Berthold, A. Naujok, and H. W. Zimmermann. 1985. Hydrophobic acridine-dyes for fluorescence staining of mitochondria in living cells. Histochemistry. 82:51–66.

[ii] Chen, L. B. 1989. Fluorescent labeling of mitochondria. Methods Cell Biol. 29:103–123.

[iii] Hu¨ glin, D., W. Seiffert, and H. W. Zimmermann. 1995. Time resolved microfluorometric study of the binding sites of cationic pyrine probes in mitochondria of living HeLa cells. J. Photochem. Photobiol. B. 31: 145–158.

[iv] Irion, G., L. Ochsenfeld, A. Naujok, and H. W. Zimmermann. 1993. The concentration jump method—kinetics of vital staining of mitochondria in HeLa cells with lipophilic cationic fluorescent dyes. Histochemistry. 99:75–83.

[v] Ro¨ ttele, J., and H. W. Zimmermann. 1993. Transport and accumulation of lipophilic dye cations at the mitochondria of HeLa-cells in situ. Cell. Mol. Biol. 39:739–756.

Version#2/08-13-07