

Cosmetic application of sustained-release nanotubes capsules via surface control

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We reported encapsulation of synthetic perfumes (eugenol and *d*-limonene) into cylindrical nanospace of organic nanotubes, so called “ONTs”. ONTs are self-assembled from tube forming glycolipids, their hydrophobized analogues, and these mixtures. As results, we prepared ONTs with both -COOH, -COOMe, and hydrophobic carbobenzoxy groups localized on cylindrical nanochannels. The ONTs are able to capture the perfumes in their hollow cylinders by capillary force upon addition of ethanolic perfume solutions. The ONT having inner surface covered with -COOH or with -COOMe exhibited high encapsulation efficiency for eugenol. On the other hand, the ONT showed moderate encapsulation efficacy for limonene. These results indicated the efficiency should be relevant to hydrogen bond formation between -OH groups of eugenol and oxygen atoms of the -COOMe on inner surface. The release of eugenol from the ONT was accelerated by hydrophilic inner surface of the nanochannels and also by high humidity of atmosphere, indicating suitable for functional release of perfumes. All these results showed that ONTs with optimized inner surface are promising nanocapsules for cosmetic applications.