

Table 17.4 Water Transport from Structurally Different Surfactant Association Colloids

Colloid type	Normalized flux values	
	Design A	Design B
15% water microemulsion	0.8	0.4
35% water microemulsion	2.5	2.0
67% water microemulsion	4.5	5.0
Lamellar liquid crystalline	2.4	1.1
Inverse hexagonal liquid crystalline	0.7	0.3
Cubic liquid crystalline	2.5	1.3

delivery from microemulsions or liquid crystals is remarkably consistent. Note that delivery from the microemulsions follows the same trends for both designs and can be described in terms of water mobility, as discussed earlier. The high water content liquid crystalline phases give approximately equivalent water transport that is approximately half the value characteristic of the highest water content microemulsions. This decrease in transport from the liquid crystalline phases is attributed to the involvement of octanol and, although probably to a smaller extent, AOT in the formation of the liquid crystalline structure. The cubic liquid crystalline phase illustrates this point. Without a doubt, the stiff amphiphilic films that are necessary to produce the cubic liquid crystal results in the dramatic decrease in self diffusion of octanol and AOT. The diffusion of octanol within the vehicle likely becomes slower than the diffusion of octanol across the skin. Thus, a component of the vehicle that was required to produce enhancement is no longer limited in its effect by slow diffusion across the stratum corneum-dermis barrier, rather the enhancer is limited by slow diffusion out of the cubic liquid crystalline vehicle. Note that the self-diffusion coefficient of water within the cubic phase is equivalent to the self-diffusion coefficient of water within the high water content microemulsions, whereas the transport of water across the skin is approximately half for the cubic phase compared with the microemulsion.

The low water transport value for the lamellar liquid crystal is not readily explained in terms of decreased diffusivity of octanol. The amphiphilic film for the water-octanol-AOT bilayer region is probably more fluid than for the cubic liquid crystal. For the la-