

Surfactant Association Colloids as Topical Drug Delivery Vehicles

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I. INTRODUCTION

The addition of a surface active agent to a drug delivery vehicle can result in improved drug stability and clinical potency, increased drug absorption, and decreased drug toxicity (1). If the drug vehicle containing a surfactant is further optimized to form a microemulsion or lyotropic liquid crystalline system, the additional advantages of potentially increased solubilization of a poorly soluble drug and thermodynamic stability are realized (2). For microemulsions, these advantages stem from an apparent particle size in the range of 100 to 1000 Å compared with the 5000 to 10,000 Å minimum particle size, typical of macroemulsions. The use of micellar systems, microemulsions, and lyotropic liquid crystals as topical drug delivery vehicles will be the focus of this chapter. Collectively, these molecularly structured vehicles are called *surfactant association colloids*. A description of these vehicles and current progress concerning their formulation will be followed by a discussion of *in vitro* percutaneous absorption experiments that have been used to evaluate surfactant association colloid vehicles.

Before proceeding with this chapter, it is important to define the term *microemulsion*. Unfortunately, this term has different meanings depending upon whether the investigator has a colloidal chemistry background or a pharmaceutical background. In this chapter we will consider a microemulsion to be a system of water, oil, and amphiphile(s) that forms a single phase, transparent or translucent (opalescent), fluid, isotropic dispersion that is presum-

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