
5 Chemical Partitioning into Powdered Human Stratum Corneum

A Useful In Vitro Model for Studying the Interaction of Chemicals and Human Skin

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5.1 INTRODUCTION

Chemical delivery/absorption into and through the skin is important in both dermato-pharmacology and dermato-toxicology. The human stratum corneum is the first layer of the skin and constitutes a rate-limiting barrier to the transport of most chemicals across the skin (1). Chemicals must first partition into the stratum corneum before entering the deeper layers of the skin, the epidermis, and the dermis to reach the vascular system. Chemical partitioning proceeds much faster than complete diffusion through the whole stratum corneum, and the process quickly reaches equilibrium. In addition to binding within the stratum corneum, a chemical can be retained within the stratum corneum as a reservoir (2). Thus, understanding the process of chemical partitioning into the stratum corneum becomes important in developing an insight into its barrier properties and transport mechanisms.

Human stratum corneum has been used for decades as an in vitro model to explore both percutaneous absorption and the risks associated with dermal exposure (3–5). The human stratum corneum includes the horny pads of palms and soles (callus) and the membranous stratum corneum covering the remainder of the body (6). The traditional method of preparation is via physical-chemical and