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Functional pharmaceutical excipients for skin delivery

Norman Richardson BASF Pharma Solutions, USA

In topical drug formulations the selection of excipients, the amount of each excipient and the complexes and phases that they form in the formulation are collectively responsible for all of the performance attributes of the final product. By their physicochemical nature, different classes of topical excipients (e.g. high melting point lipidic materials, oils, hydrophilic fluids, linear and globular polymers, nonionic and anionic and cationic emulsifiers, etc.) perform different functions in the topical dosage form. Excipients contribute to or influence viscosity, spreadability, aesthetic properties, API solubilization and/or solid state, as well as the physical and chemical stability of the formulation, dermal drug permeation and many other attributes. Formulators seek to leverage excipient functionalities to develop products with specific performance attributes that (1) allow for aesthetically acceptable application to the treatment area, (2) deliver the active to the appropriate location (e.g. surface of the skin, epidermis, dermis, systemic, etc.), (3) enable the active to permeate the stratum corneum barrier, when necessary, (4) prevent irritation and maintain mildness throughout the use of the product and (5) maintain chemical and physical stability of the product throughout its shelf life.