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Review article

# Preformulation: The use of FTIR in compatibility studies

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**Key words:** Compatibility studies, preformulation, Fourier Transform Infrared Spectroscopy, Differential Scanning Calorimetry, Isothermal Stress Testing-Fourier Transform Infrared Spectroscopy, Isothermal Stress Testing-High Performance Liquid Chromatography.

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**Abstract**

Studies of active pharmaceutical ingredient (API) - excipient compatibility represent an important study in the preformulation stage of the development of new dosage forms. The potential physical and chemical interactions between an API and the excipients can affect the chemical nature, the stability and bioavailability of the former and, consequently, its therapeutic efficacy and safety. Solid dosage forms are generally less stable than their API components. Despite the importance of API-excipient compatibility testing, there is no universally accepted protocol to assess such interactions.
Fourier Transform Infrared Spectroscopy (FT-IR), Differential Scanning Calorimetry (DSC), Isothermal Stress Testing-Fourier Transform Infrared Spectroscopy (IST-FT-IR), Isothermal Stress Testing-High Performance Liquid Chromatography (IST-HPLC), are commonly used as screening techniques for assessing the compatibility of an active pharmaceutical ingredient (API) with some currently employed excipients. Through the assignment of spectral bands, FTIR provides information on chemical reactions taking place between the API and the excipient. Thus, this procedure gives formulation scientists information on which chemical groups to avoid in the excipients, favoring the development of more stable blends.