

Pharmaceutical Applications

RTA Application note # 08

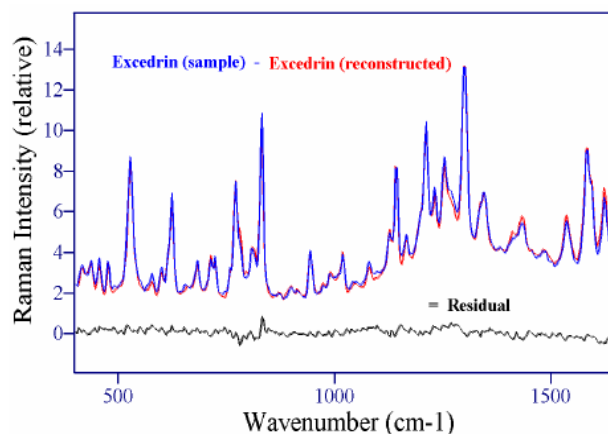
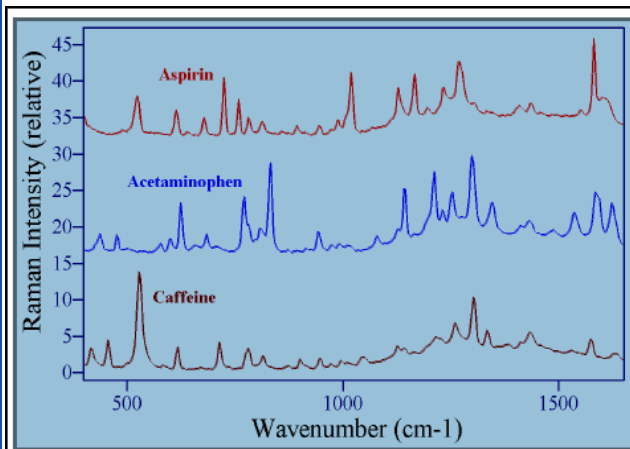
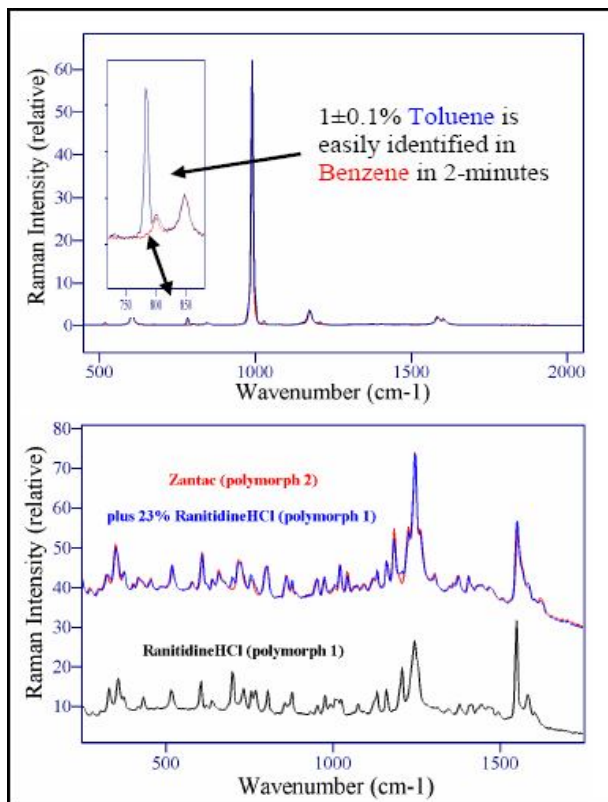
The **Industrial Raman Analyzer** has been designed specifically for operation in demanding production facilities and is ideal for drug manufacturing applications, such as:

Raw Materials Identification

To meet current Good Manufacturing Practices, the raw materials used to manufacture drugs must be identified and certified. The contents of a 55 gallon drum can be identified as benzene in 5 seconds using our hand-held fiber optic probe. And within 2 minutes, toluene as a contaminant is also identified and quantified to $1 \pm 0.1\%$.

Polymorph Analysis During Crystallization

Many chemicals can crystallize out of solution into one or more crystallographic forms depending on solvents used, cooling rates, and other parameters. In the case of pharmaceutical drugs, these polymorphs may have different physicochemical properties that alter therapeutic effectiveness (e.g. dissolution rate, bioavailability, etc.). A fiber optic probe integrated into a crystallizer could monitor the presence of 2% polymorph 2 (18% shown here) in polymorph 1 during **ranitidine** crystallization.



Pill Composition and Uniformity

Critical to meeting Federal Drug Administration guidelines is the assurance that shipped pills contain the correct amount of active and excipient ingredients. In the case of an Excedrin tablet, the main components can be identified within 1 second following a 20 second scan, and quantified in another 1 second. The non-uniformity of the pill is obvious as the single-point analysis yields 34% caffeine, 55% acetaminophen, and 11% aspirin, as opposed to the desired quantities of 12, 44 and 44%, respectively. A point-by-point map performed in 10 minutes yields a surface distribution 20, 28, and 52%, respectively, and further suggests incomplete mixing during pill blending operations.

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