

ABOUT DFM

DFM is Denmark's National Metrology Institute (NMI). DFM is a signatory to the CIPM-MRA arrangement that ensures mutual recognition of measurements worldwide

DFM provides metrology services and technology primarily to high-tech companies within the pharmaceutical, photonics and advanced manufacturing industries.

ISO CERTIFICATION

All services are covered by DFM's ISO 9001 certification

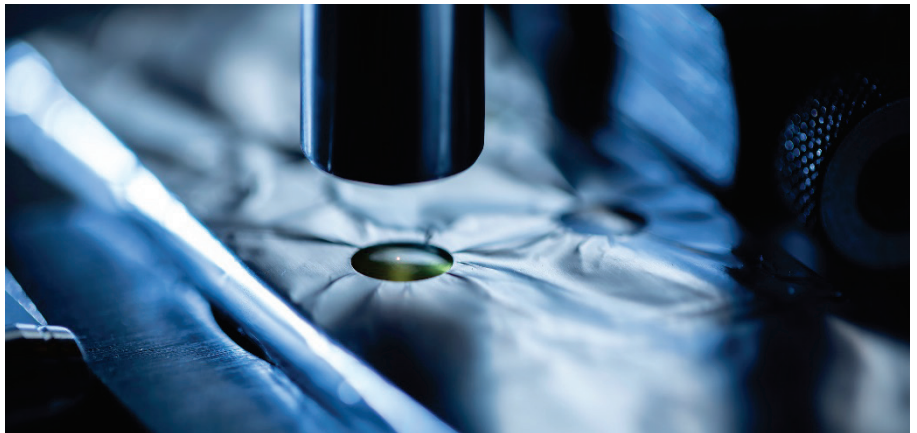
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Quantitative Raman Spectroscopy

Application to pharmaceutical development and production



Applications

Reliable method and equipment for quantitative analysis of materials are of high importance for many industries such as the pharmaceutical, food and biotechnology industries. In particular, Raman spectroscopy is a non-destructive optical method that probes the molecular bonds and structure of a material. Raman spectroscopy provides detailed information on the chemical composition of a variety of samples, in solid, liquid or gas form. Furthermore Raman spectroscopy requires little to no sample preparation allowing for in-line analysis or rapid measurement of sample series. In relation to pharmaceuticals, Raman spectroscopy finds application in quality control at production sites, improvement of production process and development of new formulations and products.

Methods

DFM has a dedicated team with a decade of experience in all aspects of Raman spectroscopy and capabilities to perform:

- spontaneous Raman spectroscopy with UV, visible and NIR excitation;
- stimulated Raman spectroscopy (SRS) on transparent solid samples;
- fiber-enhanced Raman spectroscopy (FERS) on solutions and suspensions of nanoparticles.



CONSULTANCY SERVICES

Do you need new measurement capabilities, does a method call for a bit of scrutiny, or are you perhaps seeking to acquire new equipment? Take advantage of the consultancy services we provide in addition to our calibration services.

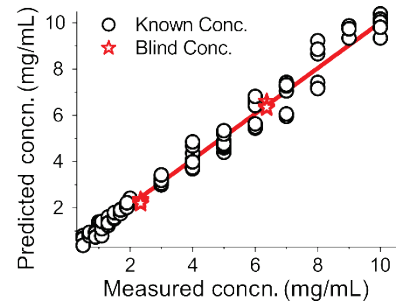
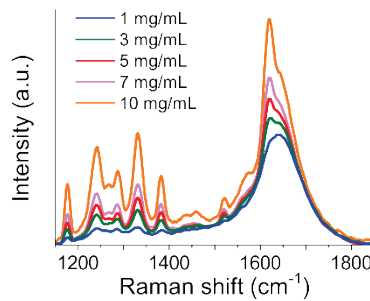
As an independent institute deeply rooted within research and metrology, DFM has gained the reputation of being an agile, solid, and valuable partner. Contact us and find out why.

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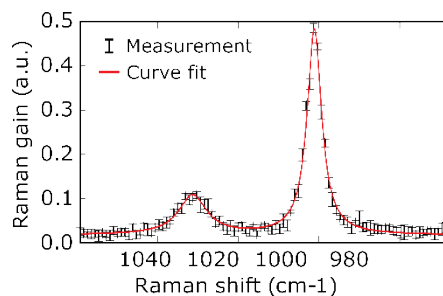
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Services



Quantitative Raman measurement of active substances in solution with concentrations down to 0.5 mg/ml. (Ref. 1. and 2.)

Example: Quantification of paracetamol solutions in water.

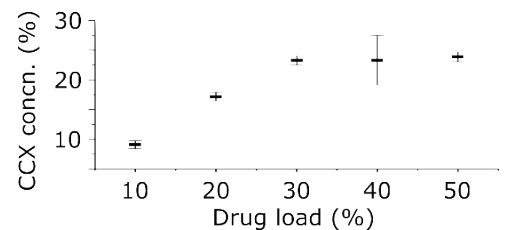
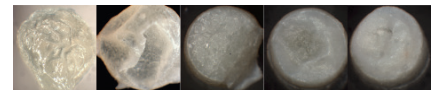


Stimulated Raman spectroscopy for traceable characterization of reference material for Raman spectrometer calibration.

Example: Raman spectrum of a polystyrene NIST traceable reference sample.

Determination and quantification of crystalline forms of an active substance in a tablet. (Ref 3.)

Example: Quantification of Celecoxib in a polymeric amorphous solid dispersion with PVP.



Quantification of polymer nanoparticles with number concentrations above 10¹³/ml

Example: Fiber-enhanced Raman spectroscopy setup.

References

1. Duraipandian et al., Analytical Methods. **10**, 3589-3593 (2018)
2. DFM Report PubID 66
3. Edinger et al., Eur. J. Pharm. Sci. **117**, 62-67 (2018)

Contact DFM to receive more information about our Raman spectroscopy capabilities.