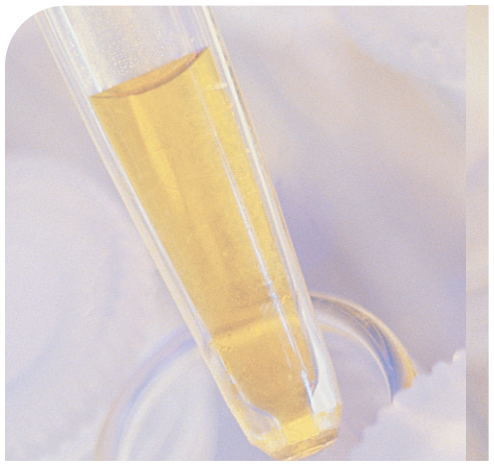

Laboratory Products Focus

DISPERSION, AGITATION AND MILLING WITH A SINGLE DRIVE

IKA®-Werke GmbH & Co. KG

Reducing the particle size of substances is often the cause of difficulties in the laboratory and, depending on the type of sample, may even pose a risk to the operator. The new ULTRA-TURRAX® Tube Drive (UTTD) minimises these problems by making use of single-use tubes.

The preparation of samples accounts for a large proportion of the time needed for most chemical analyses. Recent studies have show that laboratory staff can spend as much as 55% of the overall time taken to perform an analysis just preparing samples properly.

The UTTD Workstation comprises, in addition to the UTTD, two stirring tubes (ST-20), two dispersing tubes (DT-20), two ball-mill tubes with glass balls, two ball-mill tubes with stainless-steel balls, removal hooks for taking out the rotor-stator unit and a mains power supply.

This figure illustrates the degree of potential offered by new technical solutions when it comes to optimisation of procedures. Along with decomposition and extraction, particle size reduction is one of the most commonly used sample preparation methods. A huge variety of equipment is used for these tasks, including laboratory mills, mortars and various other typed of homogenisers.

"THE SINGLE-USE DISPERSING TUBES NOT ONLY PREVENT CROSS-CONTAMINATION, BUT ALSO SAVE TIME SINCE THE SYSTEM DOES NOT HAVE TO BE CLEANED."

The ULTRA-TURRAX® Tube Drive (UTTD) developed by IKA® is a universal, single-use dispersing system that guarantees safe, speedy, and high-quality sample preparation for sectors including human medicine, diagnostics, tumour biology, pathology, chemistry and cosmetics.

The simple-to-use drive is equipped with a continuously-variable speed controller, offering speeds between 300 and 6000 rpm. This ensures that it is suitable for a wide range of applications, from gentle agitation of samples to vigorous particle size reduction.

The timer switch function that appears on the digital display makes jobs reproducible and quick to perform. The modular construction of the device means that it is equally well suited to individual analysis tasks and mass screening work. What's special about the UTTD single-use tube is that it is hermetically sealed as soon as the cover is closed.

Three different types of single-use tube are available:

- The ST-20 Stirring Tube (comprising tube, mixing unit and cover) is suitable for mixing, agitation, extractions, suspension of soil samples, and solution testing of pharmaceuticals.
- The DT-20 Dispersing Tube (comprising tube, dispersing unit and cover) is suitable for dispersion, homogenisation and producing suspensions of animal, human and plant-based samples for medical diagnostics and the study of metabolism.
- The BMT-20 G/S (comprising tube, mixing unit, glass or steel balls and cover) is used for dry-milling of dry and brittle samples (plaster, colour pigments, tablets), cell maceration and preparation of material-in-liquid suspensions.

DISSOLVING TABLETS AND REDUCING PARTICLE SIZE

The conventional method of preparing tablets for analysis involves first crushing them using a ball mill, then dissolving them in the appropriate solvent to prepare a solution for subsequent analytical investigation. The disadvantage of this procedure is obvious: the ball mill has to be cleaned. This not only takes a lot of time, but can also lead to false analyses as a result of cross-contamination or inadequate cleaning. It is also possible for the operator to breathe in particles of the powder created, which can represent a health risk. The UTTD single-use concept is ideal here. Simply place the tablets, solvent and stainless steel balls together in the tube (BMT-20 S) and set the desired processing time on the UTTD. While the solution is being processed the operator is free to prepare further samples or analyse previously dissolved tablets.

Advantages of this method of working are:

- Save time and money because no cleaning is required
- Avoid any risk of cross-contamination due to transfer of substances
- Increase operator safety through use of hermetically sealed single-use tubes

ULTRA-TURRAX® Tube Drive (UTTD)

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HOMOGENISATION OF TISSUES

Small volumes of cells, in particular micro-organisms, can be triturated in a mortar with sand or Al_2O_3, or using a glass-bead mill. Homogenisation using ultrasound is also possible, whereby the cells are destroyed by continually colliding against each other (cavitation forces). There are numerous disadvantages associated with these conventional methods. The use of reusable containers introduces the risk of cross-contamination, something that can only be avoided by intensive cleaning after every sample. This necessarily means an increase in the time taken for each task. Because most homogenisation takes place in open containers, laboratory employees are constantly exposed to the risk of contracting contagious illnesses (BSE, AIDS, tuberculosis) when working with infected tissues. The probes used for ultrasound homogenisation can become very hot, which can lead to samples being destroyed or chemically altered. Using mechanical equipment (Potter/mortar) for the trituration means that the method cannot be validated, since the time taken and degree of homogenisations are dependent on the operator. In addition, the laboratory employee loses a lot of time because every sample requires manual intervention. These problems can all be minimised by the introduction of the UTTD: simply place the tissue and the dispersing solution into the dispersing tube (DT-20) and wait a short time (between half a minute and five minutes) until the sample is homogenised.

The new single-use tubes (BMT-20 shown here) form the basis of the UTTD single-use concept.

The single-use dispersing tubes not only prevent cross-contamination, but also save time since the system does not have to be cleaned. The operator is protected from aerosols thanks to the hermetic seal on the single-use tube. The design of the UTTD ensures no heat is developed that could destroy or alter the sample. Moreover, the method can be validated, as the operator only has to enter the time and speed on the UTTD. In addition to the time saved by not cleaning containers, the operator also saves time by not having to monitor the homogenisation process.

SUMMARY

The UTTD distinguishes itself in particular by allowing dispersion, agitation and milling to be carried out using a single drive.

The hermetically sealed single-use tubes offer security and a high level of protection for the user. In addition to this, the fact that no cleaning is required ensures that procedures are clean and hygienic, cross-contamination is avoided, and a significant amount of time is saved. The UTTD is suitable for both individual analysis tasks and mass screening work.

Further information on the ULTRA-TURRAX® Tube Drive, including a downloadable user manual, technical data sheet and flyer, can be found at **www.ika.net**

- Video showing how the ULTRA-TURRAX® Tube Drive works
- Download the entire IKA® catalogue as a PDF
- Contact IKA® directly - Tel. +49 (0) 76 33 8 31 0