TELSONIC
ULTRASONICS
SWITZERLAND

Ultrasonic

Sonochemistry

Ultrasound Technology
in the Chemical Industry

SONO-
CHEMISTRY

Process optimization in chemistry and pharmacy with Ultrasound

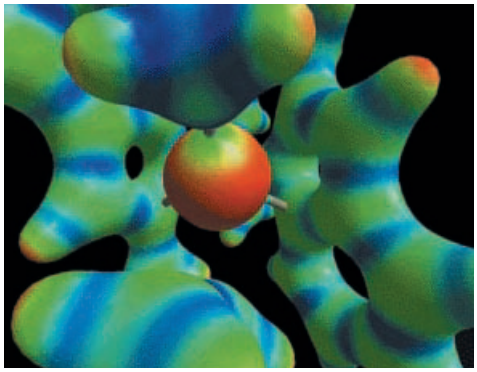
High-power Reactor SRR for various applications

Ultrasound Technology in the Chemical Industry

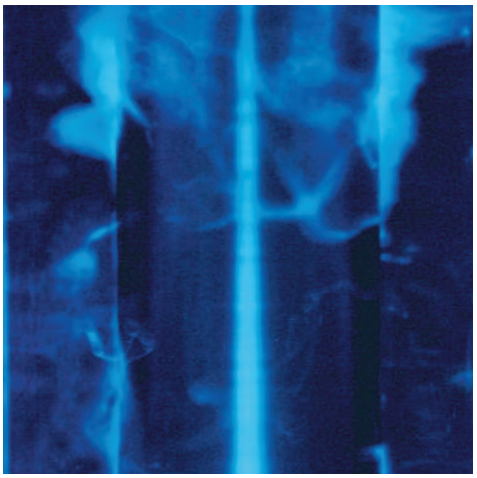
Ultrasound technology is used as a modern and very environment-friendly process in an increasing number of applications and processes of the chemical industry. Particularly noteworthy are the application options of this technology in pharmacy, chemistry, biotechnology, and environmental engineering. The applications make use of the various effects of ultrasound for the processing of gaseous, liquid, and solid media. Over the years, Telsonic developed a product portfolio for ultrasound process technology which covers the majority of today's applications.

More efficiency and better quality with ultrasonic activated processes

Size reduction of color particles within the nano-range with high power ultrasound



Mixing ratios in the microbe realm become possible with ultrasound



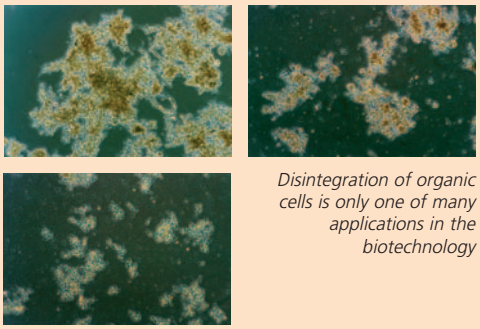
Cavitation flags at the ultrasonic oscillator

Mixing procedures

A very important application of ultrasound is in the mixing and homogenising, emulsifying, suspending, and dispersing of various products. Ultrasound can be used to produce emulsions, e.g. petroleum spirit-water mixtures. Moreover, depending on the specifics of the application, ultrasound can be used to degas a medium or enrich it in oxygen or ozone. It is even possible to defoam liquids in special applications.

Small disintegration system DG 100, which is used particularly in laboratories

Not only in the laboratory, also in industrial applications the Ultrasonic Systems are used to emulsify, disperse, homogenize and suspend

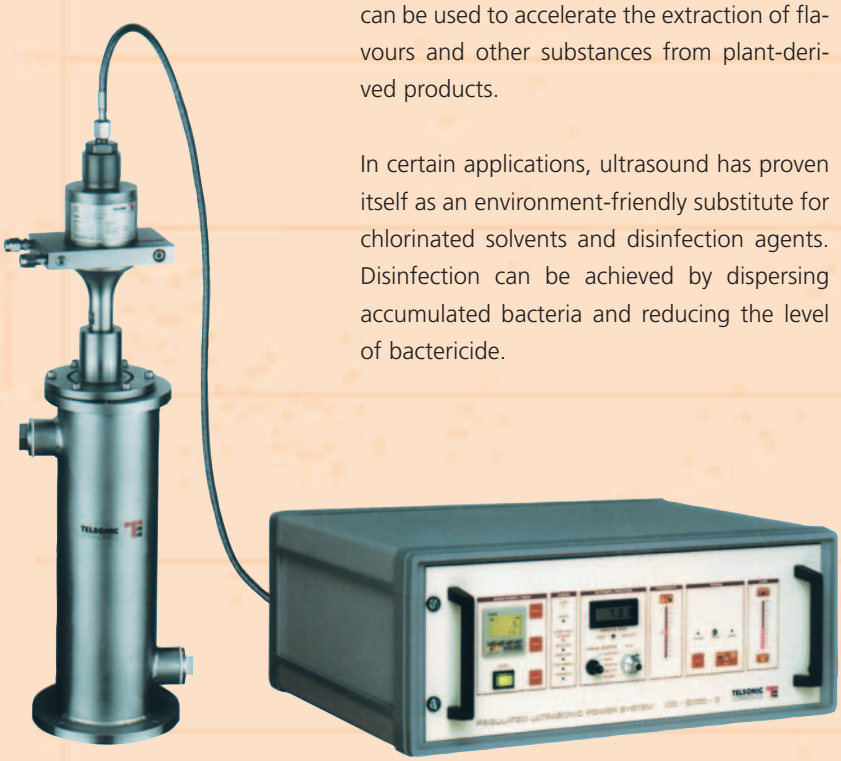


Disintegration of organic cells is only one of many applications in the biotechnology

Biotechnology

In biotechnology, ultrasound is applied both for specific activation (or deactivation) of enzymes and for manipulation and separation of biological cells by purposeful disintegration of their content. As an example, ultrasound can be used to accelerate the extraction of flavours and other substances from plant-derived products.

In certain applications, ultrasound has proven itself as an environment-friendly substitute for chlorinated solvents and disinfection agents. Disinfection can be achieved by dispersing accumulated bacteria and reducing the level of bactericide.



For industrial processes the Sonoreactor SRR with generator DG 2000 is frequently used

With Ultrasonic Technology, different chemical procedures can be affected and accelerated favorably

Sonochemistry

Ultrasound process technology is a unique method for the activation and acceleration of processes in chemistry, petrochemistry, and biotechnology. In chemical synthesis, ultrasound supports organometal intermediary products and promotes most types of catalytic processes. Moreover, ultrasound has a generally accelerating and favourable impact on heterogeneous reactions.

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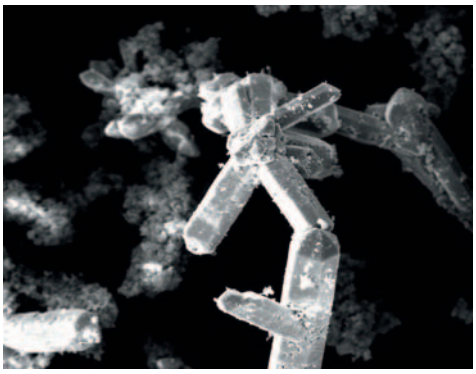
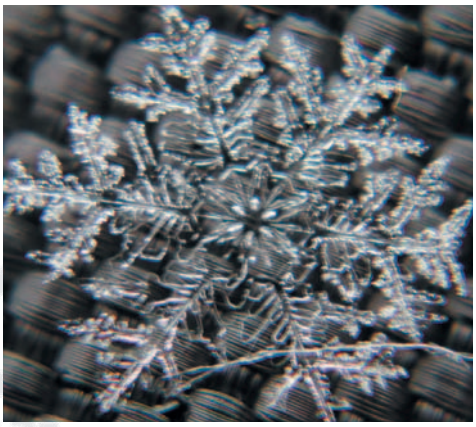


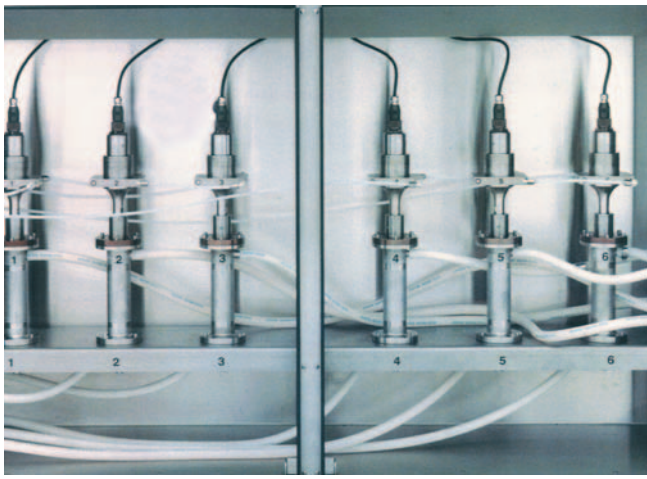
The production of artificial crystals can be highly simplified by cavitation

Disintegration of particles

High performance ultrasound can also be used to reduce the particle size of minerals, powders, paints, and lacquers. The application of ultrasound for disintegration of paint pigments in the printing and toner industry or for pharmaceutical products is utilised on an industrial scale in many places. Even chocolate particles for liqueurs have been reduced in size with this technology, which demonstrates that the applications of ultrasound extend even to the food-processing industry.



Crystallization procedures can be accomplished purposefully and without foreign substances with Ultrasound



Industrial application with 6 Gap Reactors for size reduction of color particles (up to 1 micrometer)

Ultrasound crystallisation

Recently, it has been reported commonly that crystallisation can be promoted by ultrasound. The crystallisation process can be started through the presence of cavitation bubbles alone and thus requires no use of foreign substances. This technology is attracting much interest mainly in the pharmaceutical and fine chemicals industry.

Ultrasound treatment of sewage

Another special application of ultrasound is its use in environmental engineering. Some clarification plants have started to use ultrasound to disintegrate sludges. The aim pursued by disintegration may vary: the primary goal is to reduce the sludge volume and therefore the costs of disposal. Aside from the reduction in volume, the putrefaction is enhanced leading to higher bio-gas yields. In addition, it is also possible to control filamentous bacteria very efficiently and lastingly, since these bacteria cause the production of floating (scum) and bulking sludge. Ultrasound thus affords substantial savings from the reduced use of chemical additives. Ultrasound may in some case even be used as a remedy for problems with foam-producing digestion towers.

Water treatment

Another application from the realm of environmental engineering is the use of ultrasound in potable water treatment. Ultrasound is used in this application to support common procedures such as UV irradiation and ozone treatment.

Ultrasonic Disintegration System of our partner VTA Technology GmbH for the application on waste water treatment plants

Ultrasound is also often used in places in which it is essential to keep bodies of water free from algae or other biological cultures. Ultrasound provides an extremely environment-friendly procedure since it requires no chemical additives.

Other applications

Other special applications include e.g. wire cleaning facilities, ultrasound-based cutting facilities, atomising/fog generating facilities, and many more.

ALPHA
Alpha bvba
Kleimoer 2, 9030 Gent, Belgium
Tel. +32 9 243 80 90, Fax. +32 9 243 80 91
Info@alpha.be, www.alpha.be