

éCO-extraction

transfrontalière

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a l c o t r a



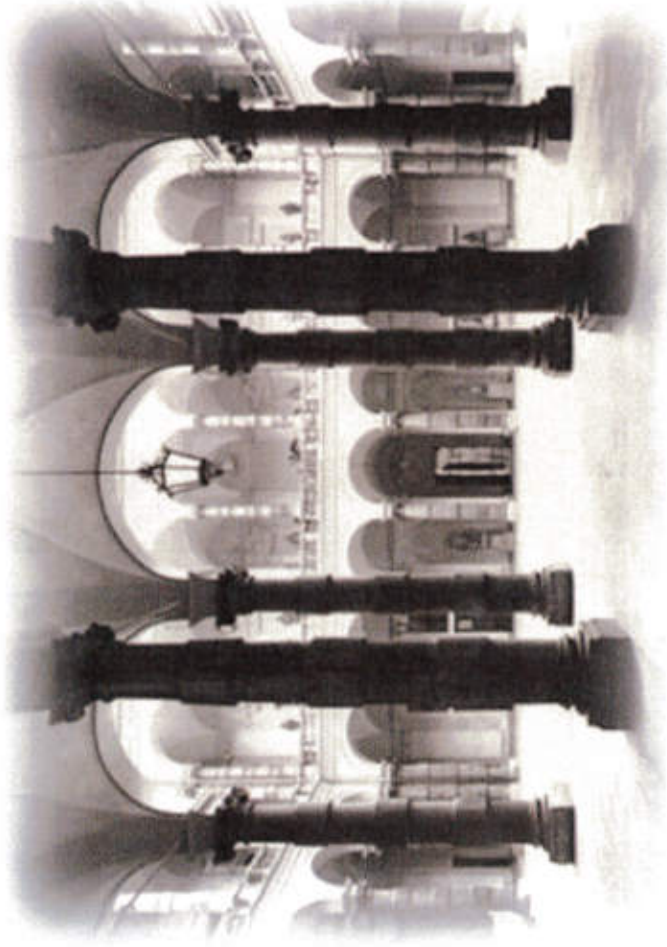
DSTF

Dipartimento di Scienza
e Tecnologia del Farmaco
UNIVERSITÀ DI TORINO

Comparaison des procédés d'extraction conventionnels, micro-ondes,
ultra-sons, avec différentes matrices végétales. Essais du laboratoire sur
pilotes industriels avec études de cas

PART 2

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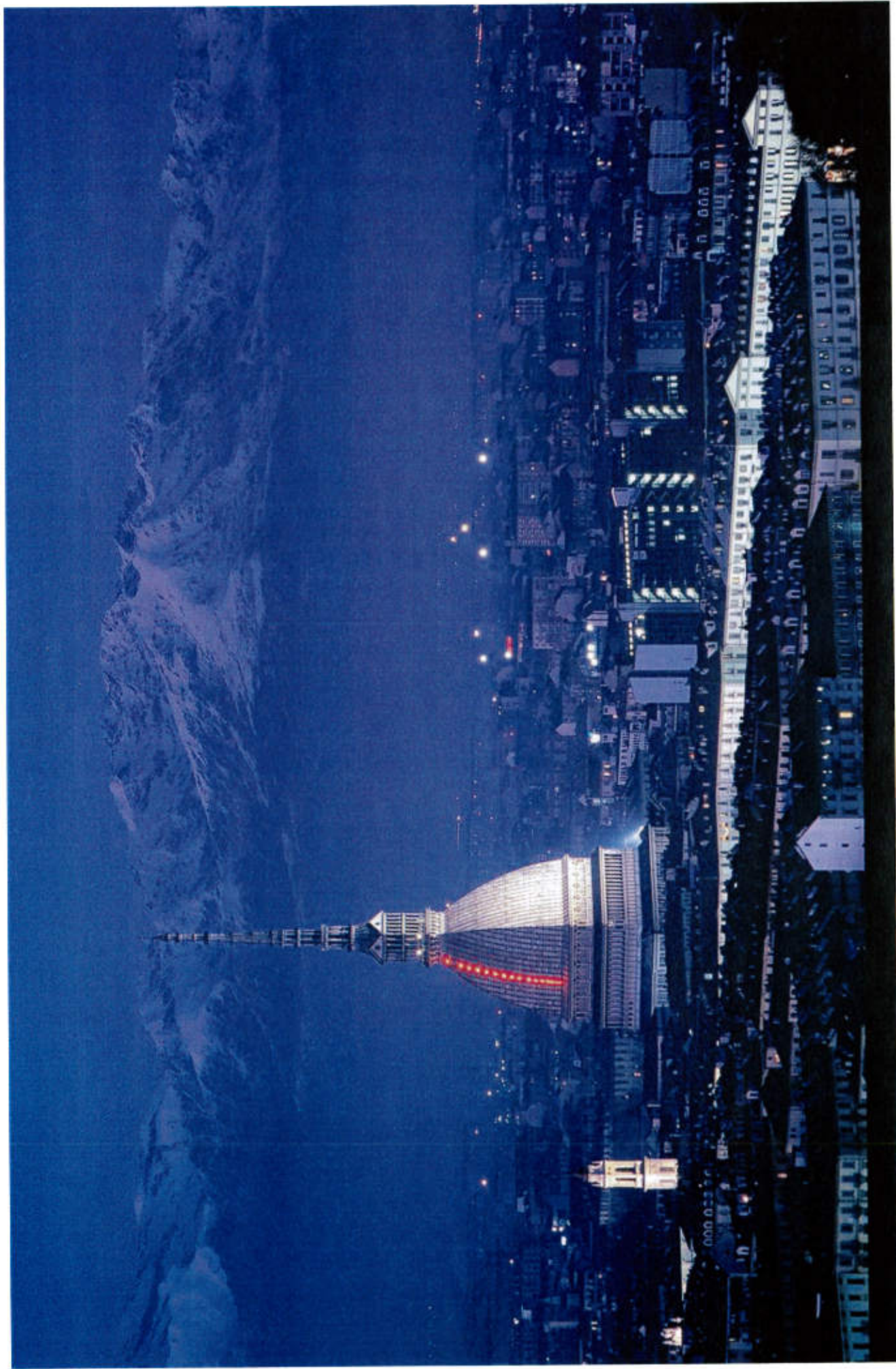


ALMA
UNIVERSITAS TAURINENSIS



University of Turin founded in 1404 by
Prince Ludovico of Savoia under the
auspices of Pope Benedict III and the
Emperor Sigmund





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8^e Plénière France Éco-Extraction

Jeudi 24 octobre 2013
Aix-en-Provence



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 **8^e Plénière France Éco-Extraction**

Fields of application

Pharmaceutical, phytochemical, cosmetic and food industry

Partenaires

DSM Nutritional Products, Soremartec – Ferrero SpA
Group, Procemsa Farmaceutici, Martin Bauer, MB
Med, Reynaldi, Pernod-Richard Italia, Medestea Int.
and others

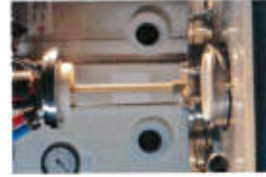
Equipments

Batch and flow ultrasound reactors:
multi-horns, vibrating baths etc.

Microwave ovens and reactors,
high-pressure microwave reactors,
microwave-generated hydrodistillation

Supercritical CO₂ extraction

Purification tools (ultrafiltration, combi-flash)
Analytical support: GC/MS, HPLC/MS, NMR



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Eco-extracts vs. traditional extracts



Mentha piperita L.; *Mentha spicata* L.



Actinidia deliciosa L.



Corylus avellana L.

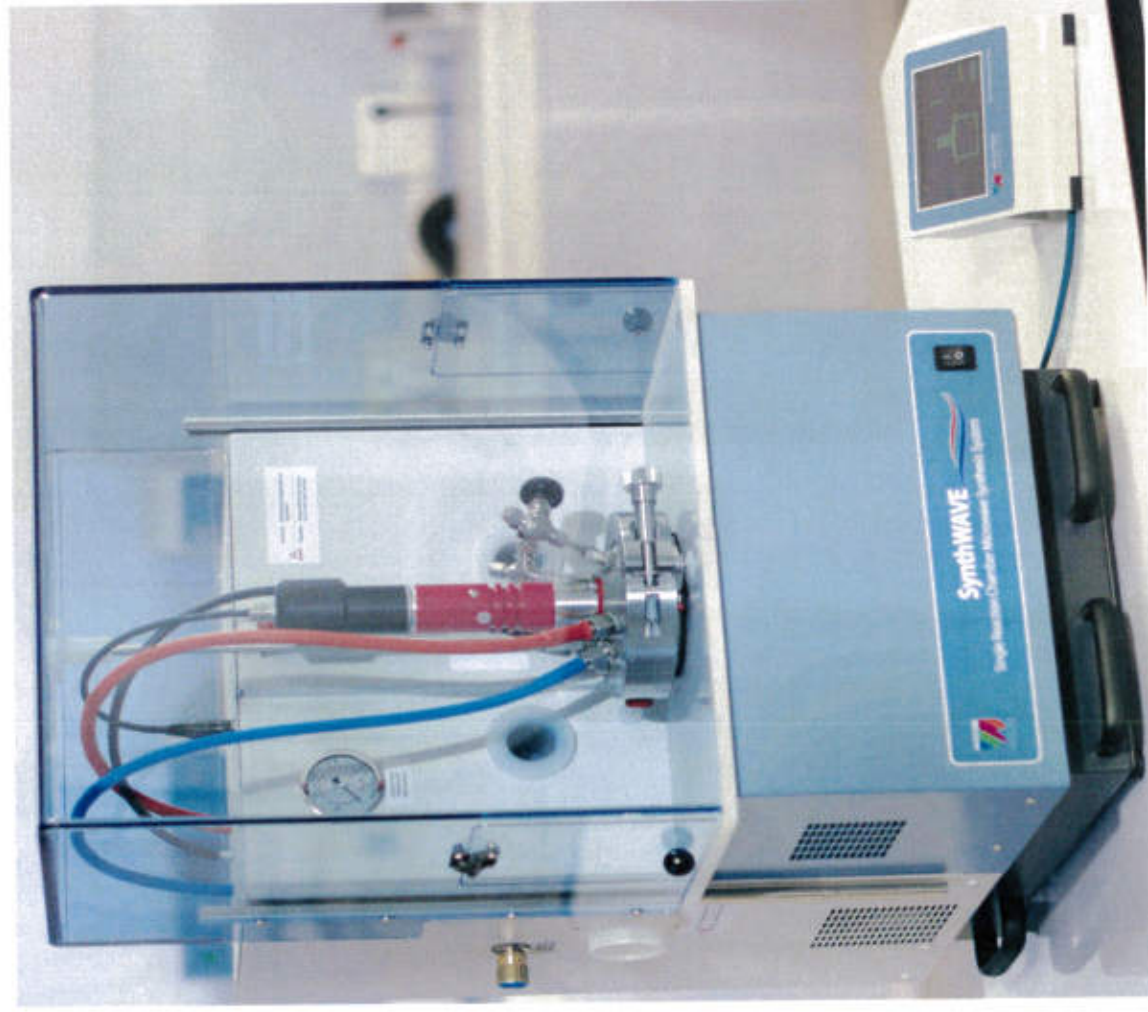


Vitis vinifera L.



Lavandula angustifolia Mill.,
Origanum vulgare L. ssp. *hirtum* (Link),
Ocimum basilicum L.,
Salvia officinalis subsp. *officinalis*,
Salvia officinalis 'Extrakta',
Salvia officinalis subsp. *lavandulifolia*,
Salvia sclarea L..

Microwave-assisted extraction (MAE)



SYNTHWAVE (Milestone)

HIGH POWER DENSITY: **1.5 kW** / 1 L

HIGH TEMPERATURE: **300 °C**

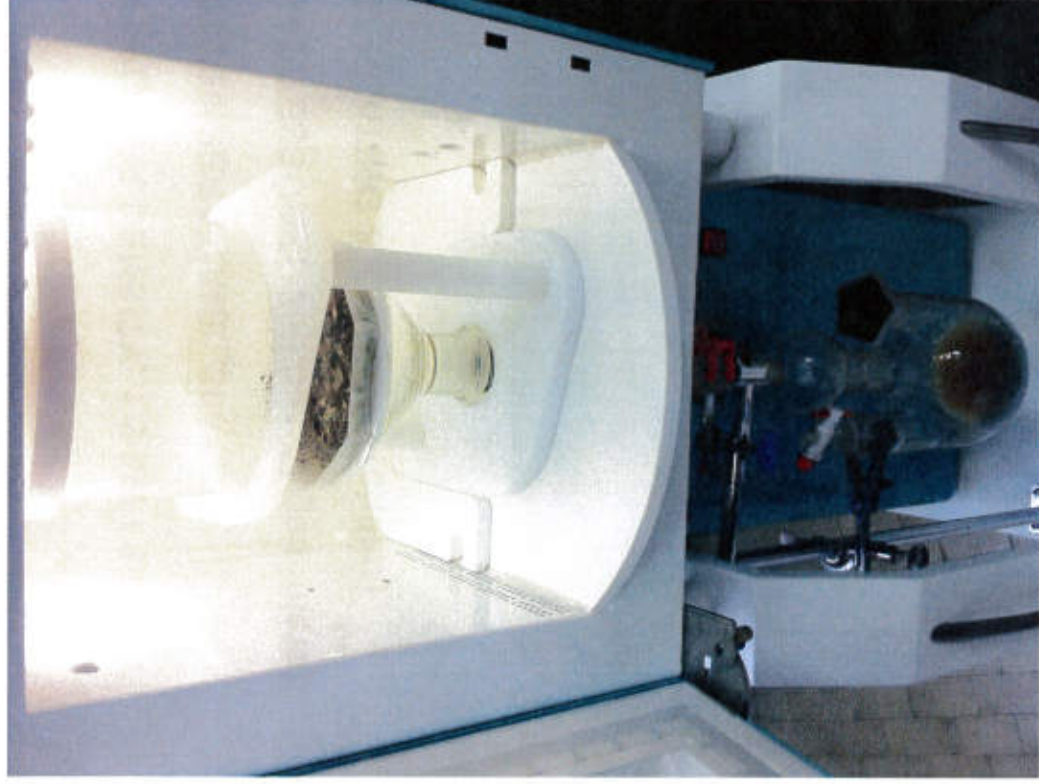
HIGH PRESSURE: **200 bar** (3 gas inlets)

FAST HEATING & COOLING (chiller)



Microwave-assisted extraction (MAE)

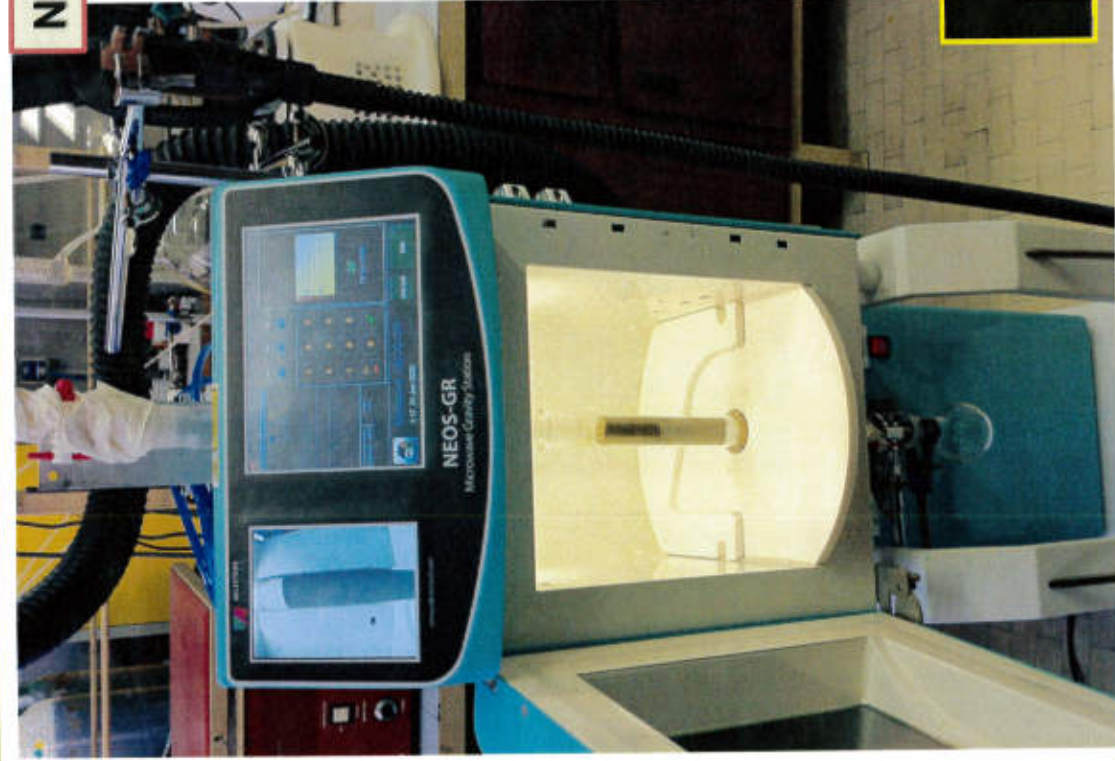
NEOS-GR (Milestone)



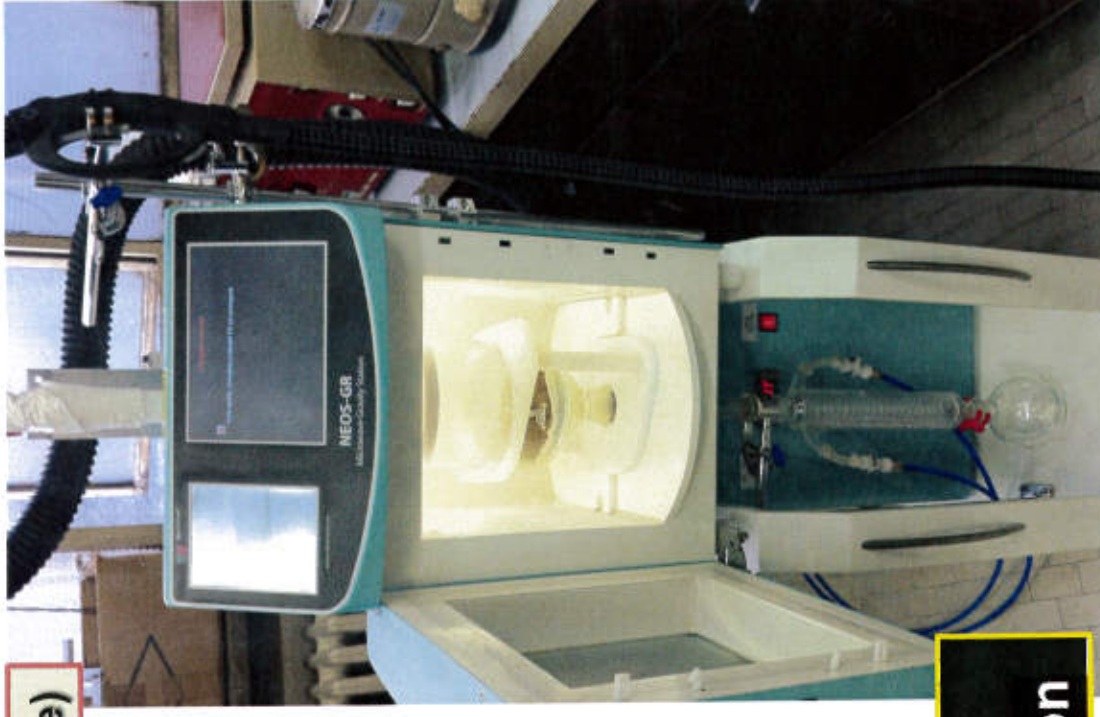
MW-assisted
hydrodistillation



Microwave-assisted extraction (MAE)



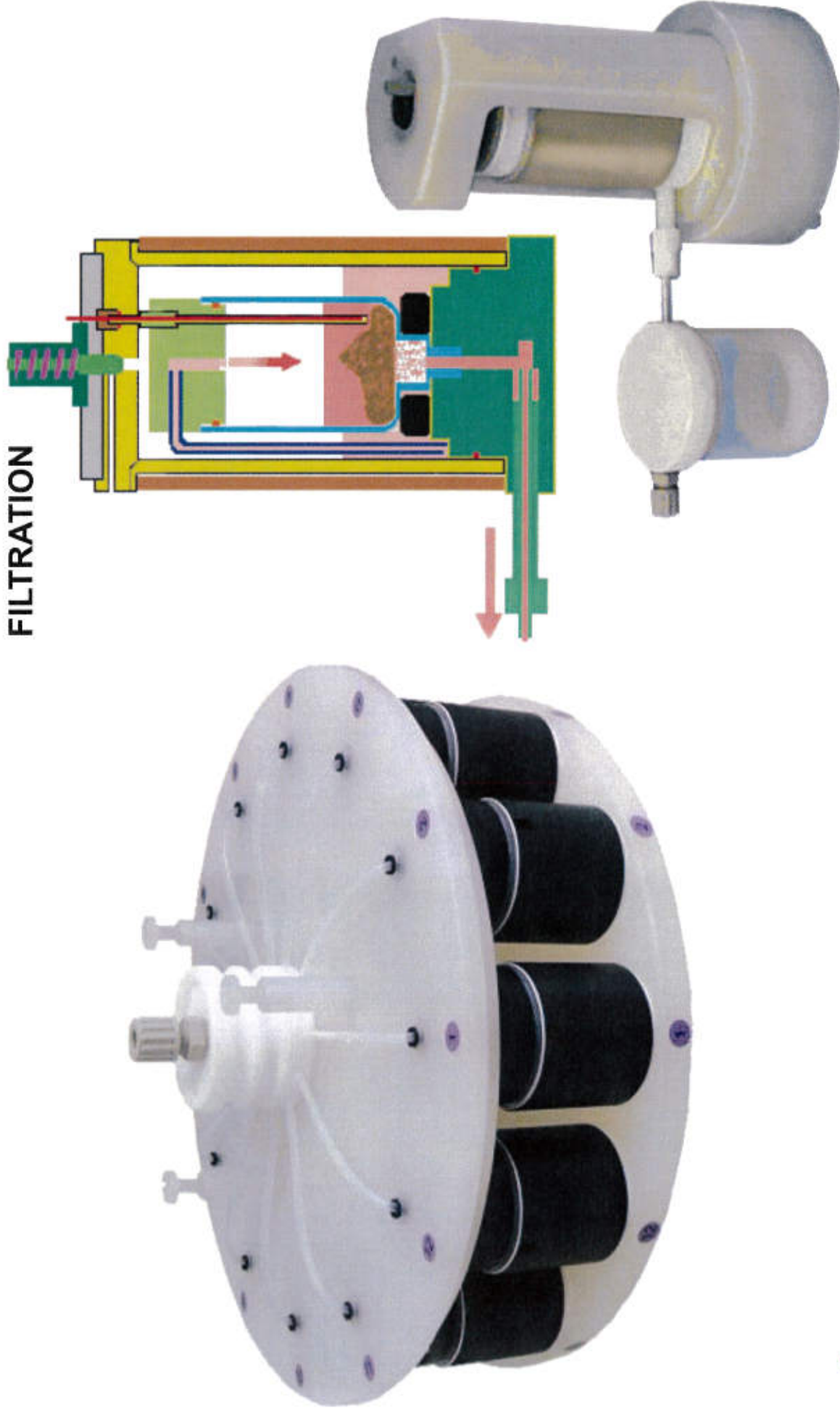
NEOS-GR (Milestone)



MW-assisted
hydrodistillation

Microwave-assisted extraction (MAE)

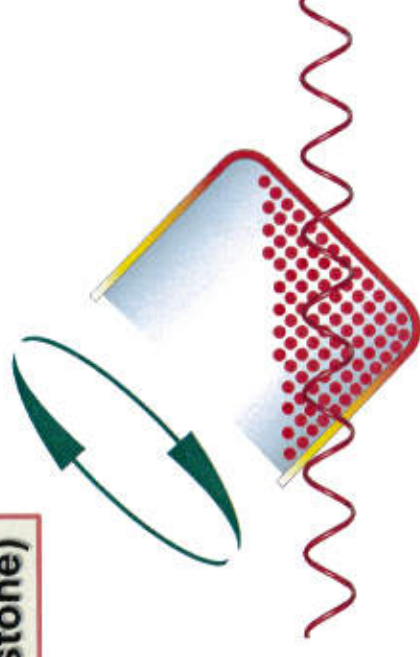
FILTRATION



Microwave-assisted extraction (MAE)



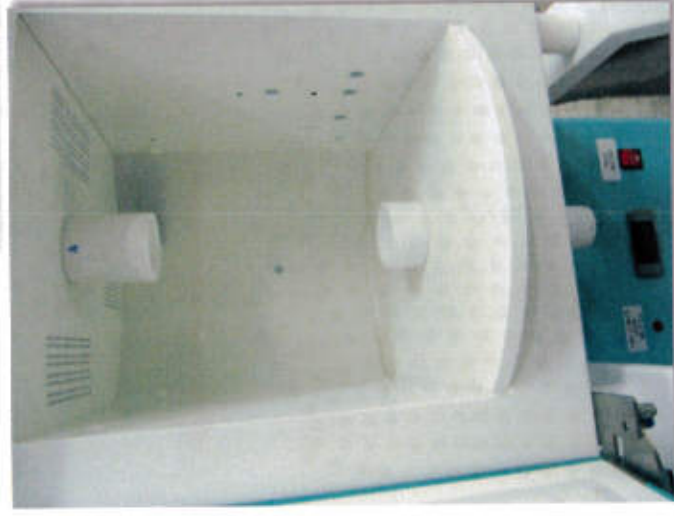
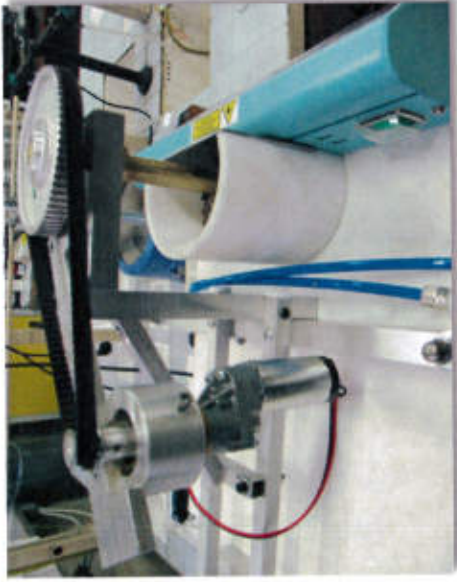
ROTOSYNTH (Milestone)



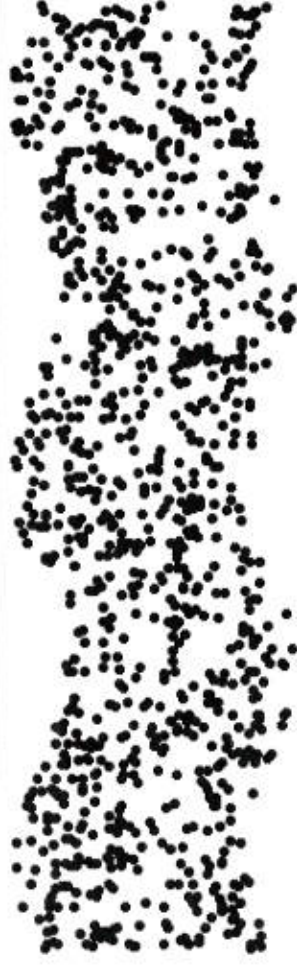
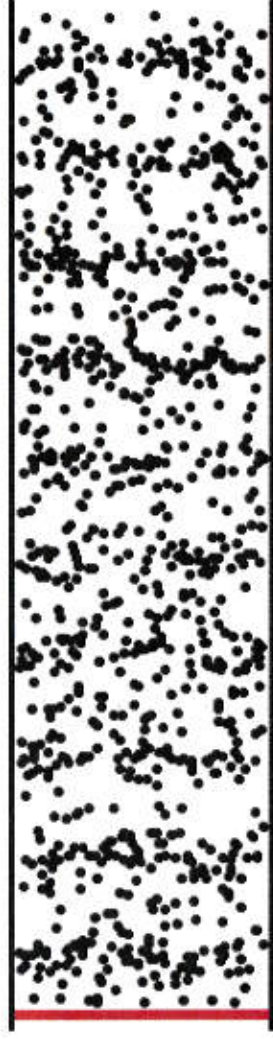
Microwave-assisted extraction (MAE)



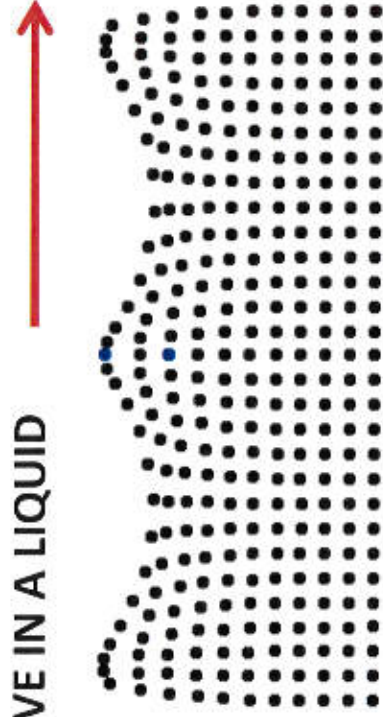
Microwave-assisted extraction (MAE)



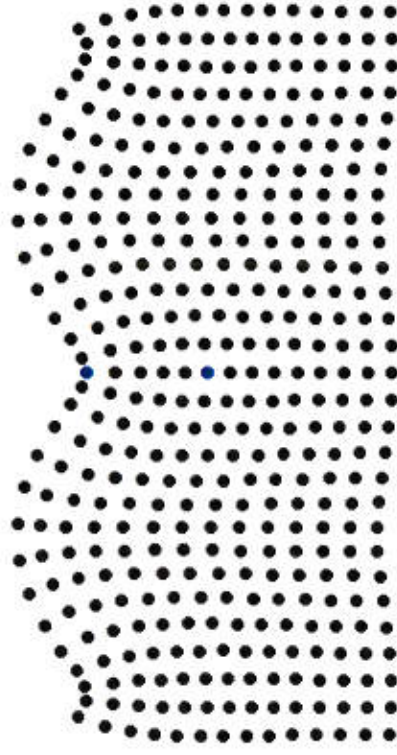
Ultrasound-assisted extraction (UAE)



WAVE IN A SOLID



WAVE IN A LIQUID

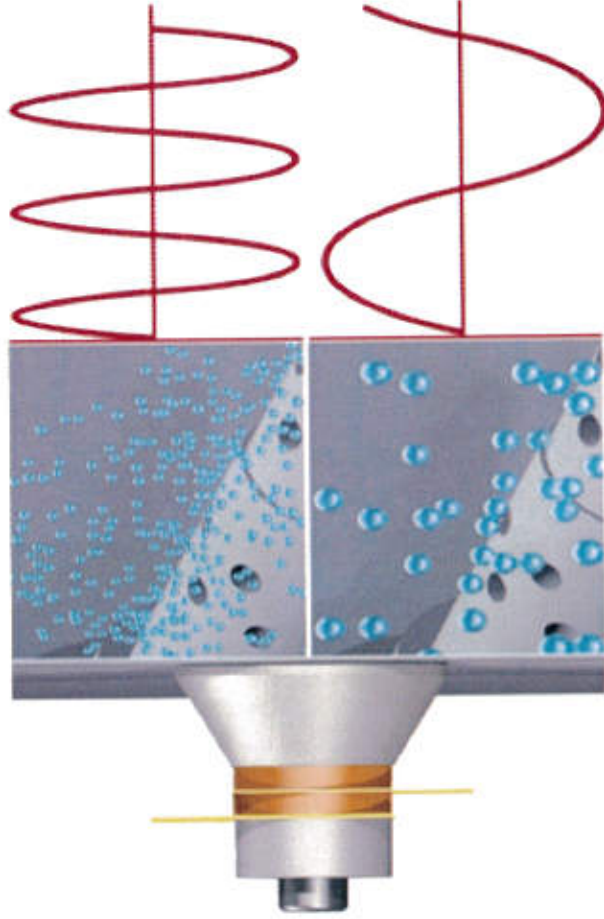


WAVE IN A SOLID

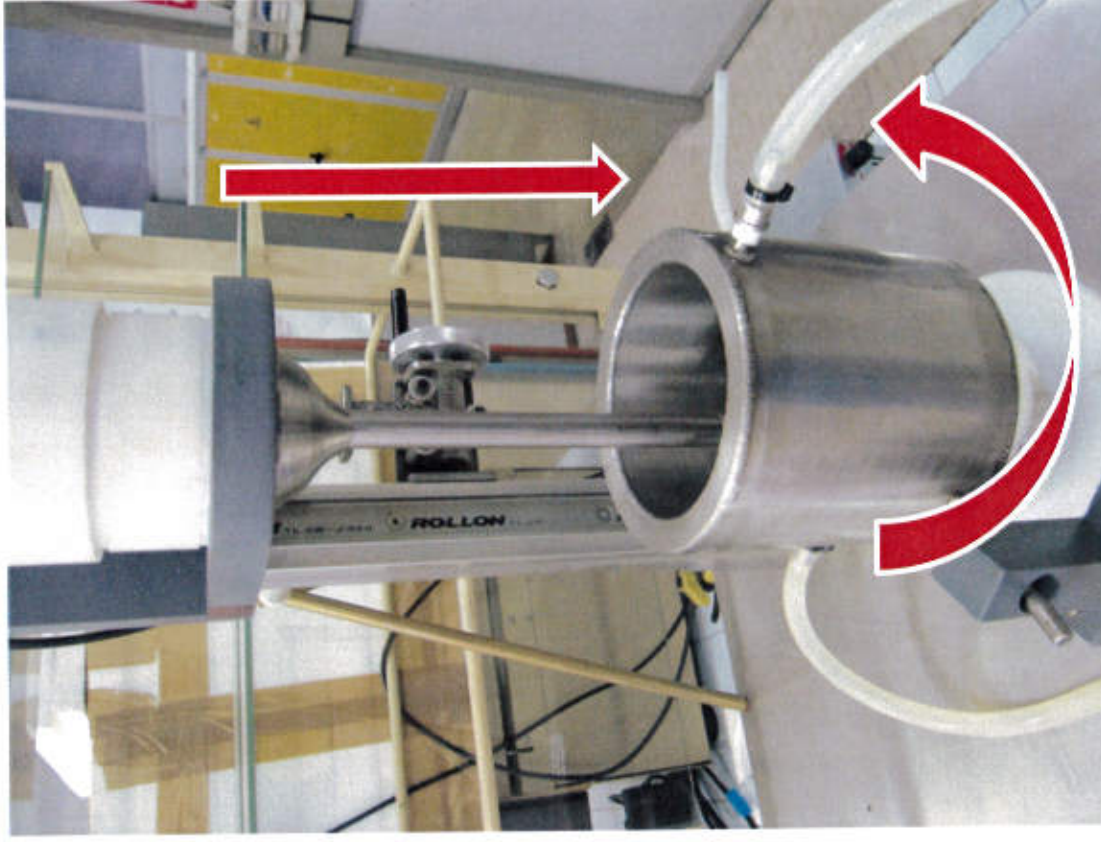
Ultrasound-assisted extraction (UAE)



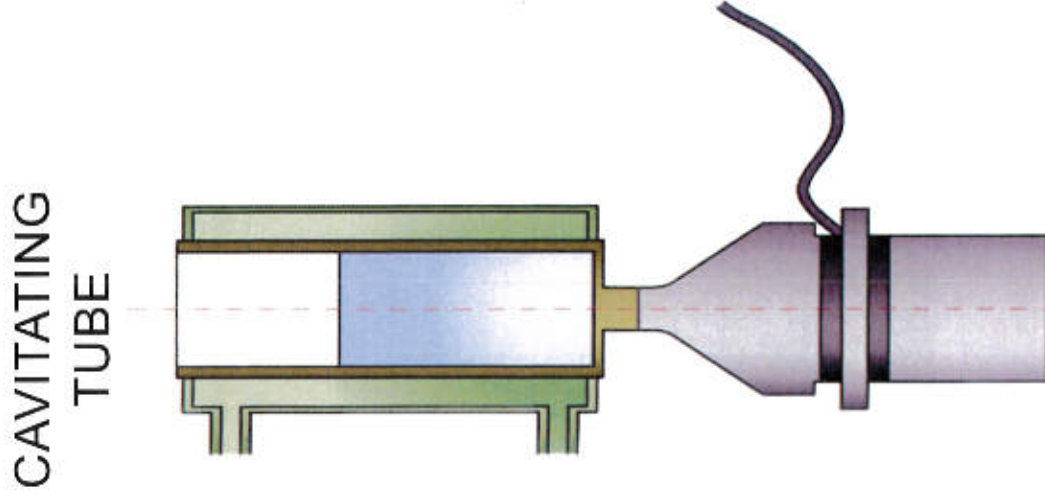
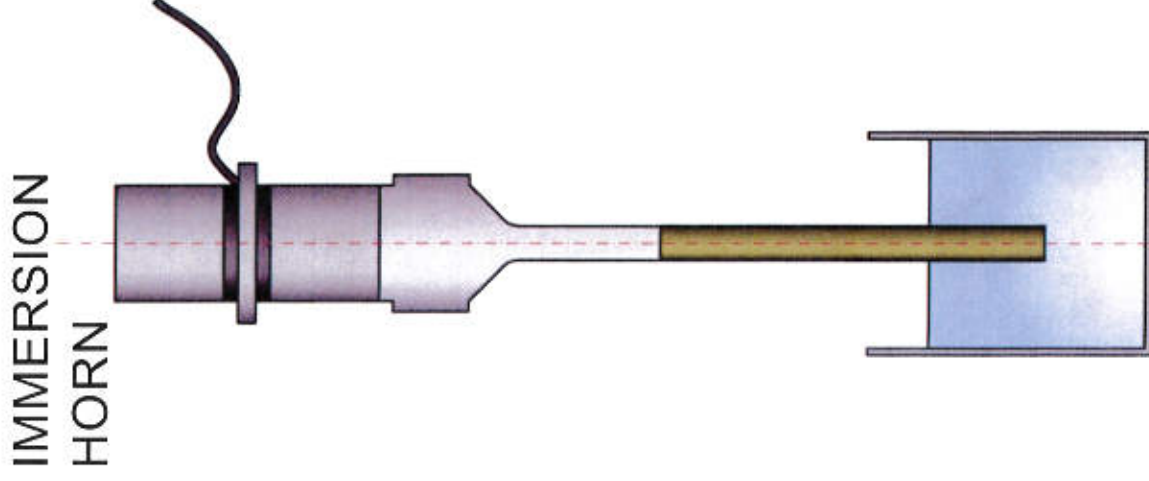
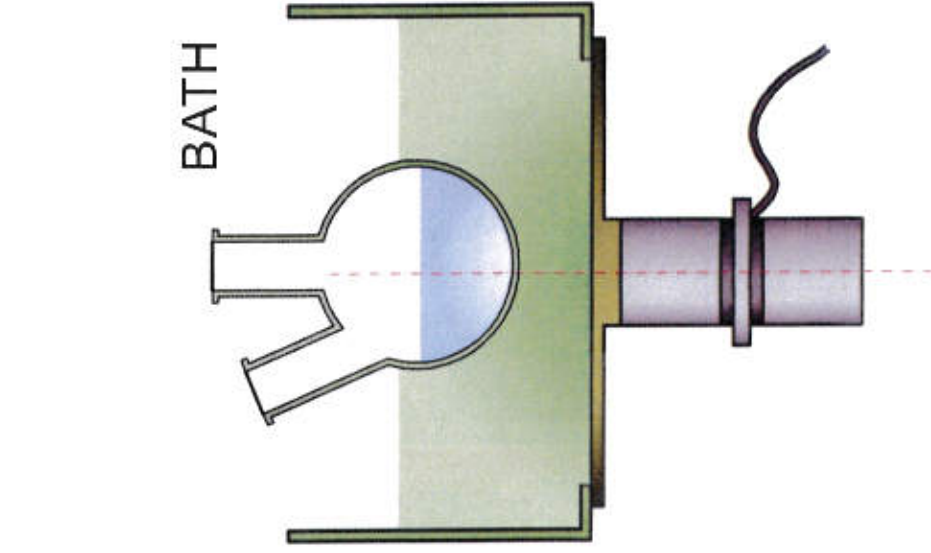
100 kHz



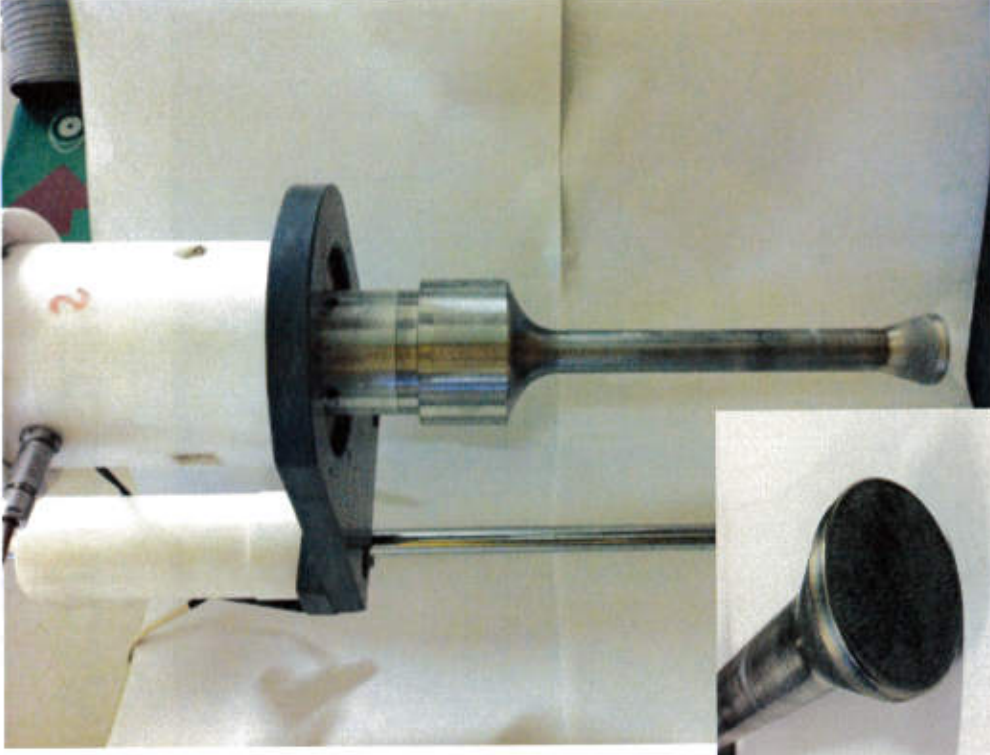
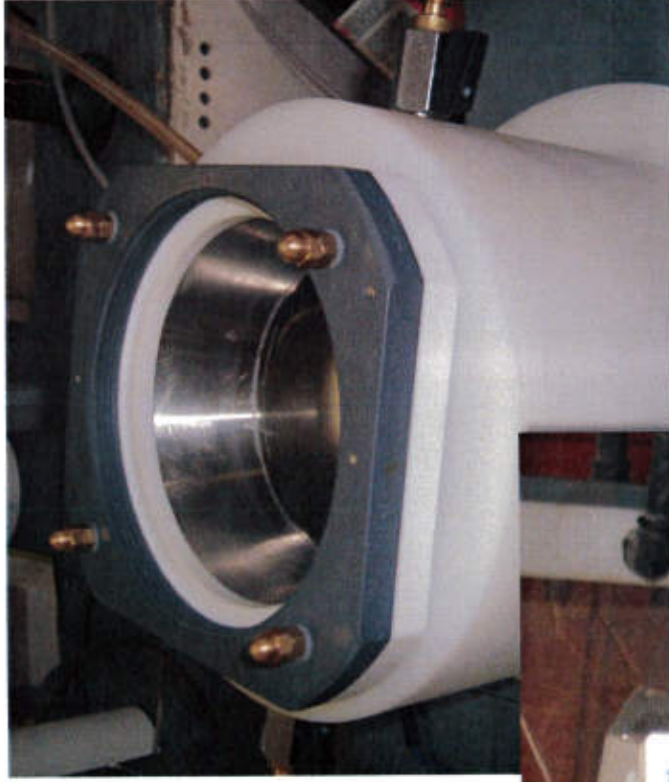
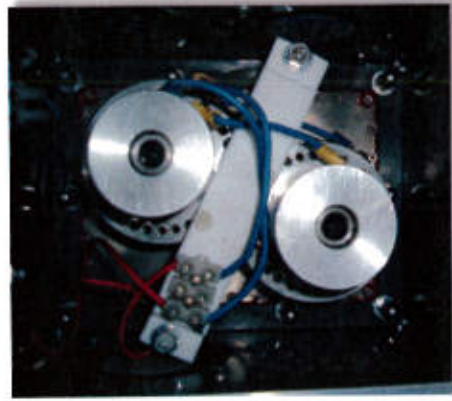
20 kHz



Ultrasound-assisted extraction (UAE)

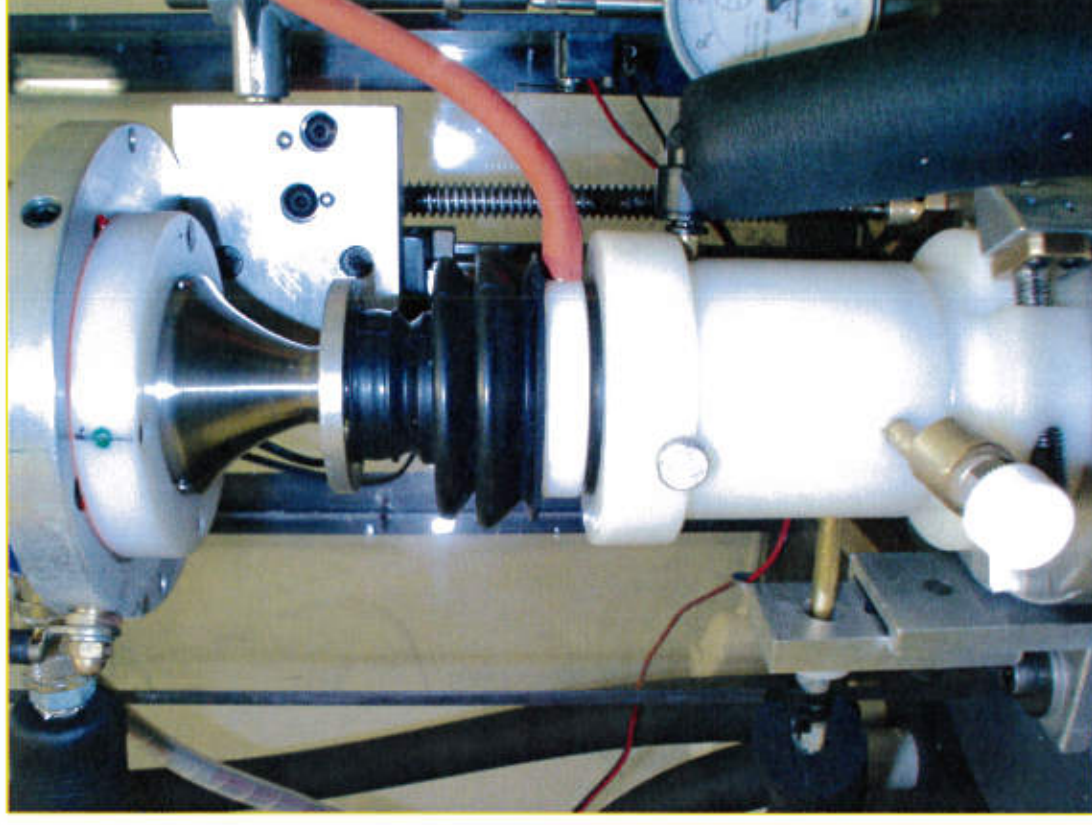
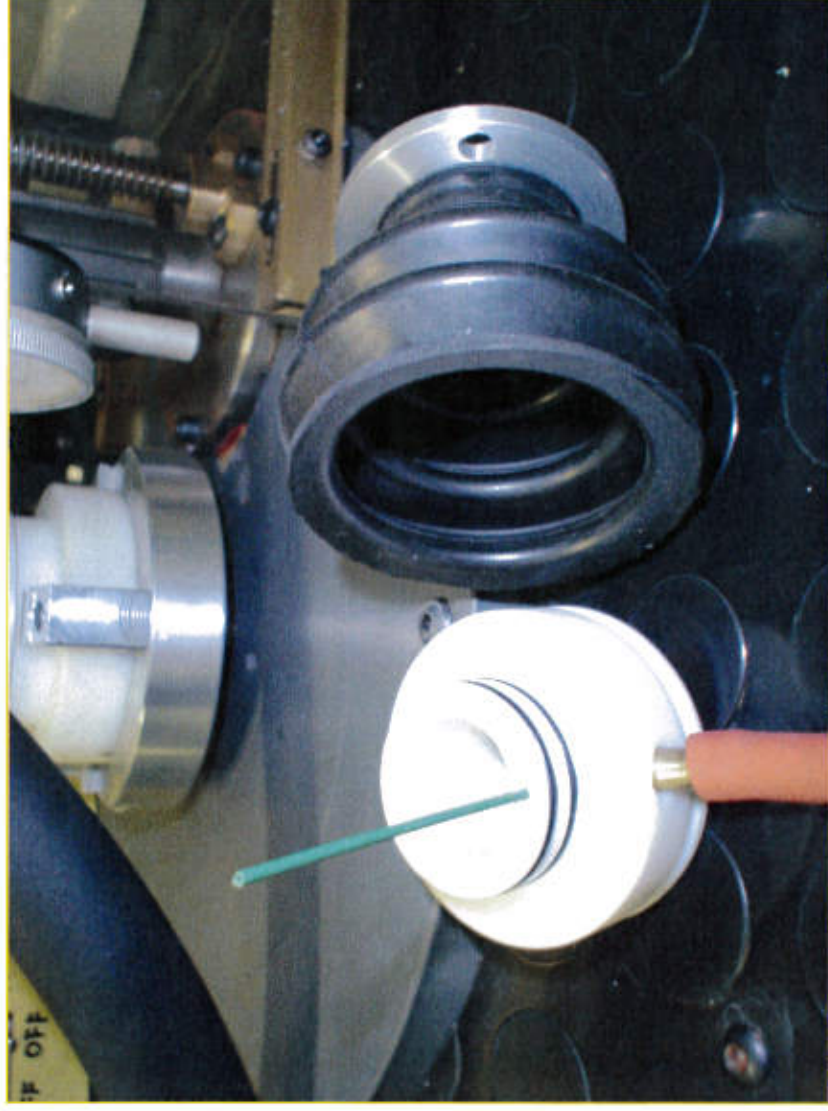


Ultrasound-assisted extraction (UAE)

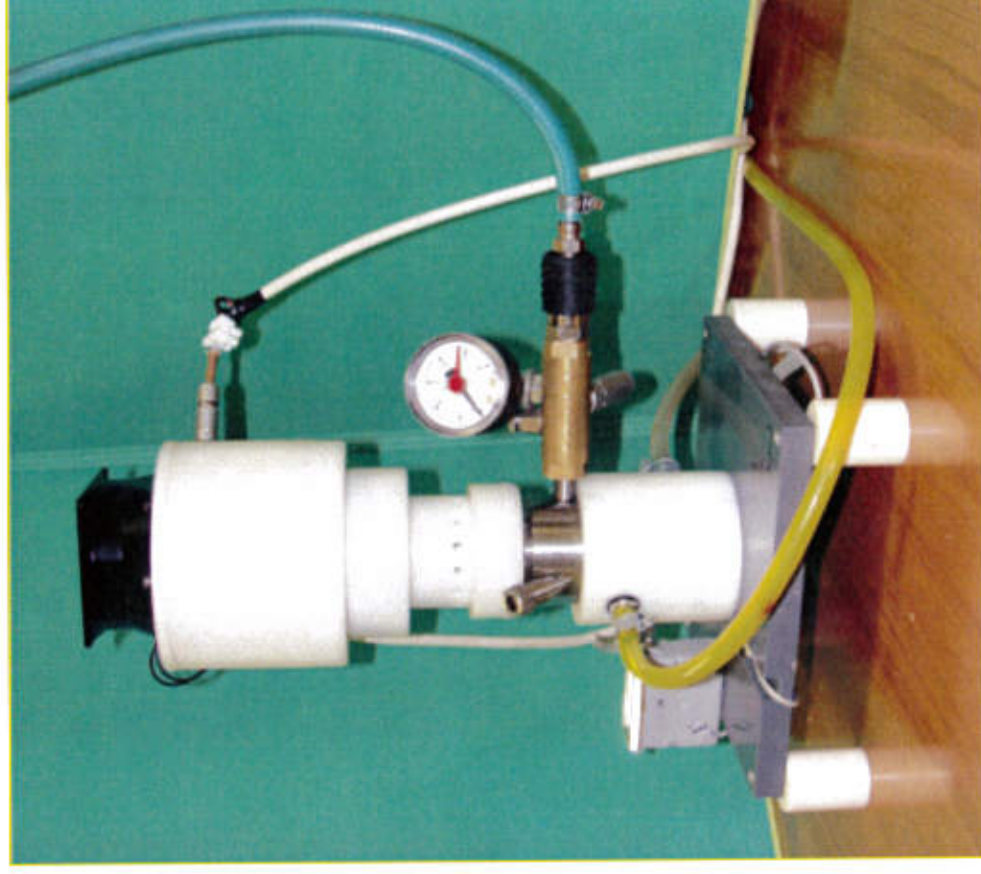
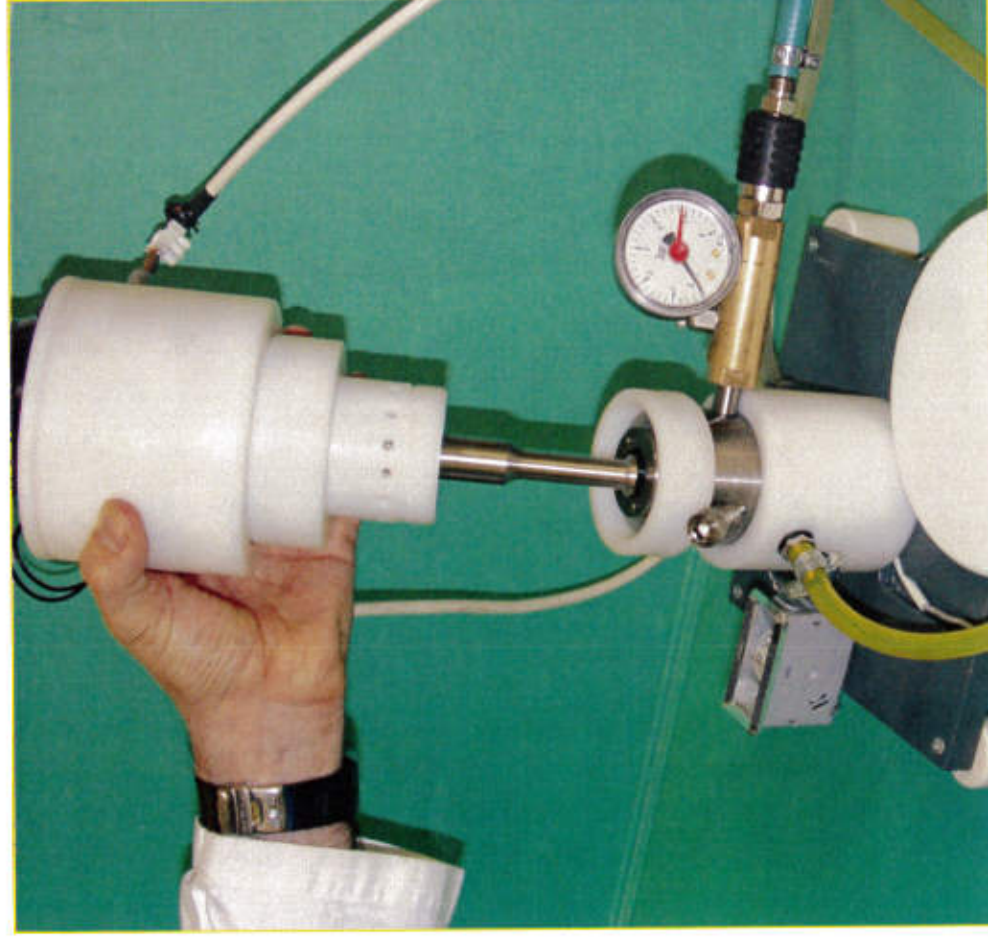


Ultrasound-assisted extraction (UAE)

MODIFIED ATMOSPHERE



Ultrasound-assisted extraction (UAE)



Ultrasound-assisted extraction (UAE)

