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Green-Chemistry Extraction: Ultrasonic 'Disruptive Frequency' and Micellar Methods

https://www.vitigrp.com/insights/green-chemistry-extraction-ultrasonic-micellar

KEY TAKEAWAYS

- Green extraction lowers solvent use, energy, and heat exposure while maintaining or improving yield.
- Ultrasound-assisted extraction uses acoustic cavitation to rupture cell walls and speed mass transfer.
- Micellar extraction uses surfactant self-assembly to capture compounds gently in aqueous systems.
- Both methods protect heat-sensitive phytoactives and align with green-chemistry principles.

AT A GLANCE

Ultrasonic method	Acoustic cavitation ruptures cell walls; faster, cooler, less solvent
Micellar method	Surfactant micelles solubilize hydrophobic targets in water
Primary benefit	Lower solvent/energy burden; protection of thermolabile actives
Approach	Processes validated from first principles per feedstock

REFERENCES & CITATIONS

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3. Chemat F, Abert-Vian M, Fabiano-Tixier AS, et al. Green extraction of natural products: concept and principles. Int J Mol Sci. 2012.