



TECHNOLOGY LICENSING OFFICE

4301 West Markham Street, #831

Little Rock, AR 72205

501.686.6696

email: nmgray@uams.edu

BV I07-46 - *Manufacture Microbubbles with very homogeneous diameters and distinct shell thickness/strength*

APPLICATION: Contrast agents for ultrasonic imaging, destruction of clots, ultrasound-induced permeability of blood vessels and other tissues, targeted drug delivery, or to enhance ultrasonic tissue ablation.

KEY BENEFITS:

- Homogeneous (uniform) size
- Variable shell strength and elasticity
- Easy synthesis
- Economical

MARKET SUMMARY: Currently, there are two commercially available microbubble preparations that are FDA-approved for clinical use in the United States: Definity (BMS) and Optison (GE). Both are filled with octafluoropentane gas, and both preparations have an average, microbubble diameter of about 3.5 μm . Both products are quite non-homogeneous with respect to the size distribution of their constituent microbubbles, with each preparation containing microbubbles with diameters that range from 1.0 μm to 6 μm . Among other physical characteristics, the acoustic properties of microbubbles vary as a function of their diameter; hence, the Definity and Optison microbubbles behave non-uniformly with respect to an insonating ultrasonic field.

TECHNICAL SUMMARY: This discovery involves new methods for 1) producing microbubbles with narrow and defined size distributions, 2) varying the serum albumin/dextrose shell to increase or decrease shell strength and elasticity, 3) store the microbubbles for protracted periods and for shipment, and 4) chemically couple peptides, antibodies, drugs, magnetic nanoparticles, and other molecules to the microbubbles to help target microbubbles to desired in vivo locations and/or to deliver therapeutic molecules to specific tissues or diseased sites.

BV I07-46 - Manufacture Microbubbles with very homogeneous diameters and distinct shell thickness/strength

Continued

This technology allows the manufacture of microbubble preparations with very homogeneous diameters and with distinct shell thickness and strength. This provides the unique capability to produce microbubbles that have defined acoustic properties to meet the demands for a wide range of clinical and research applications, e.g. sonoporation, thrombolysis, drug delivery, etc. Such flexibility does not exist for the current, commercially available microbubble preparations. The protocols presented in this disclosure provide microbubble preparations that have distinct advantages over existing preparations.

**DEVELOPMENTAL
STAGE:**

Microbubbles have been manufactured and validated according to the method

**PATENT
INFORMATION
AND CONTACT:**

App Type: NonProv

Country: US

Serial No.:

Patent No.: 9,023,321

File Date: 11/01/2010

Issue Date: 05/05/2015

Inventor(s): Michael Borrelli

Tech ID: 0746

Contact: Joe Underwood, Associate Director – Licensing, junderwood@uams.edu