9906579-5
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International Bureau

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 6 :		(11) International Publication Number:
A61K 49/00, A61B 8/00	A1	WO 99/00149
		(43) International Publication Date: 7 January 1999 (07.01.99)

(21) International Application Number: PCT/US98/13514

(22) International Filing Date: 30 June 1998 (30.06.98)

(30) Priority Data:
885,933 30 June 1997 (30.06.97) US

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(81) Designated States: AU, BR, CA, CN, CZ, HU, IL, JP, KR, MX, NO, NZ, PL, RO, SG, TR, European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).

Published
With international search report.

(54) Title: METHOD FOR ENHANCING THE ECHOGENICITY AND DECREASING THE ATTENUATION OF MICROENCAPSULATED GASES

(57) Abstract

It has been discovered that microparticles formed from natural or synthetic polymer with thicker walls have significantly enhanced echogenicity as compared with microparticles having thinner walls. The effect of wall thickness has been determined experimentally as well as inserted into a formula for use in predicting the optimum conditions. In the preferred embodiment, the polymers are synthetic biodegradable polymers and the wall thickness is between about 100 and 660 nm, although wall thicknesses from about 20 nm to in excess to 500 nm can be used. The microparticles are manufactured with a diameter suitable for the targeted tissue to be imaged, for example, with a diameter for between 0.5 and 8 microns for intravascular administration, and a diameter of between 0.5 and 5 mm for oral administration for imaging of the gastrointestinal tract or other lumens. Preferred polymers are polyhydroxy acids such as polylactic acid–co–glycolic acid, polylactide or polyglycolide, most preferably conjugated to polyethylene glycol or other materials inhibiting uptake by the reticuloendothelial system (RES). The microspheres may be used in a variety of ultrasound imaging applications including cardiology applications, blood perfusion applications as well as for organ and peripheral vein imaging.