

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
28 November 2002 (28.11.2002)

PCT

(10) International Publication Number
WO 02/094200 A3

- (51) International Patent Classification⁷: **A61L 9/04**, A61K 9/24, 38/28, 38/00, 38/16
- (21) International Application Number: PCT/US02/16464
- (22) International Filing Date: 21 May 2002 (21.05.2002)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
60/292,423 21 May 2001 (21.05.2001) US
- (71) Applicants (*for all designated States except US*): **INHALE THERAPEUTIC SYSTEMS, INC.** [US/US]; 150 Industrial Road, San Carlos, CA 94070 (US). **SHEARWATER CORPORATION** [US/US]; 490 Discovery Drive, Huntsville, AL 35806 (US).
- (72) Inventors; and
- (75) Inventors/Applicants (*for US only*): **PATTON, John, S.** [US/US]; 8 Arastradero, Portola Valley, CA 94028 (US). **KUO, Mei-Chang** [US/US]; 1823 Middlefield Road, Palo Alto, CA 94301 (US). **HARRIS, J., Milton** [US/US]; 3119 Highland Plaza, Huntsville, AL 35801 (US). **LEACH, Chester** [US/US]; P.O. Box 1597, El Granada, CA 94018 (US). **PERKINS, Kimberly** [US/US]; 1800 El Verano Way, Belmont, CA 94002 (US). **BUECHE, Blaine** [US/US]; 6655 Giannini Court, Castro Valley, CA 94552 (US).
- (74) Agents: **EVANS, Susan, T.** et al.; Inhale Therapeutic Systems, Inc., 150 Industrial Road, San Carlos, CA 94070 (US).
- (81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW.
- (84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).
- Published:
— with international search report
- (88) Date of publication of the international search report:
20 February 2003
- For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

(54) Title: PULMONARY ADMINISTRATION OF CHEMICALLY MODIFIED INSULIN

(57) Abstract: The present invention provides active, hydrophilic polymer-modified derivatives of insulin. The insulin derivatives of the invention are, in one aspect, suitable for delivery to the lung and exhibit pharmacokinetic and/or pharmacodynamic properties that are significantly improved over native insulin.



WO 02/094200 A3