

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
13 November 2003 (13.11.2003)

PCT

(10) International Publication Number
WO 03/092852 A1

- (51) International Patent Classification⁷: **B01D 9/00**
- (21) International Application Number: PCT/US03/12312
- (22) International Filing Date: 21 April 2003 (21.04.2003)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
60/376,414 29 April 2002 (29.04.2002) US
60/439,066 9 January 2003 (09.01.2003) US
- (71) Applicant (*for all designated States except US*): **BRISTOL-MYERS SQUIBB COMPANY** [US/US]; P.O. Box 4000, Route 206 and Provinceline Road, Princeton, NJ 08543-4000 (US).
- (72) Inventors; and
- (75) Inventors/Applicants (*for US only*): **WEI, Chenkou** [US/US]; 44 Windsor Drive, Princeton Junction, NJ 08550 (US). **AKITI, Otute** [GH/US]; 610 Aspen Drive, Plainsboro, NJ 08536 (US). **GLEESON, Margaret, M.** [US/US]; 6133 Cedar Court, Monmouth Junction, NJ 08852 (US).
- (74) Agents: **BAXAM, Deanna** et al.; Bristol-Myers Squibb Company, P.O. Box 4000, Princeton, NJ 08543-4000 (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, NI, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, 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, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).
- Published:**
— *with international search report*
- 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: CRYSTALLIZATION SYSTEM UTILIZING ATOMIZATION

(57) Abstract: Crystallization of an organic pharmaceutical compound is achieved by atomization of one solution and introduction of the atomized solution into a vessel containing a second solution where the solutions are mixed to form a product. The process can be performed on non-reactive constituents such as a solution containing the compound to be crystallized dissolved in a solvent and an anti-solvent solution. Alternatively, the process can be performed on reactive constituents, such as solutions of solvents containing different reactive intermediates, under proper reactive conditions. The process may be practiced continuously or in batch mode. Atomizers of the non-pressure-driven ultrasonic type or of the ultrasonic or non-ultrasonic pressure-driven type can be utilized.



WO 03/092852 A1