



INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁶ : C07C 405/00 // A61K 31/557	A1	(11) International Publication Number: WO 99/12897 (43) International Publication Date: 18 March 1999 (18.03.99)
(21) International Application Number: PCT/US98/18593 (22) International Filing Date: 4 September 1998 (04.09.98) (30) Priority Data: 60/058,254 9 September 1997 (09.09.97) US (71) Applicant: THE PROCTER & GAMBLE COMPANY [US/US]; One Procter & Gamble Plaza, Cincinnati, OH 45202 (US). (72) Inventors: WOS, John, August; 8505 Harperpoint Drive, Cincinnati, OH 45249 (US). DELONG, Mitchell, Anthony; 8084 Tyler's Circle, West Chester, OH 45069 (US). AM- BURGEY, Jack, S., Jr.; 265 Stockton Drive, Loveland, OH 45140 (US). DE, Biswanath; 11269 Cornell Woods Drive, Cincinnati, OH 45241 (US). DAI, Haiyan, George; 47-2 Revere Road, Drexel Hill, PA 19026 (US). WANG, Yili; 4435 Place Pointe Drive, Mason, OH 45040 (US). (74) Agents: REED, T., David et al.; The Procter & Gamble Company, 5299 Spring Grove Avenue, Cincinnati, OH 45217-1087 (US).		(81) Designated States: AL, AM, AT, AT (Utility model), AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, CZ (Utility model), DE, DE (Utility model), DK, DK (Utility model), EE, EE (Utility model), ES, FI, FI (Utility model), GB, GE, GH, GM, HR, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SK (Utility model), SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SZ, UG, 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), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG). Published <i>With international search report.</i>
(54) Title: A PROCESS FOR MAKING EPOXIDE INTERMEDIATES (57) Abstract It has been surprisingly discovered that the disadvantages of the lengthy literature procedures to synthesize 13,14-dihydro prostaglandin A, E, and F derivatives can be overcome using a novel Methyl 7-(2-hydroxy-5-(2-(2-oxiranyl)ethyl)-4-(1,1,2,2-tetramethyl-1-silapropoxy)cyclopentyl) heptanoate intermediate, which can be synthesized from commercially available Methyl 7-[3-(R)-hydroxy-5-oxo-1-cyclopent-1-yl] heptanoate. This novel intermediate can be coupled with oxygen, carbon, sulfur, and nitrogen nucleophiles, in the presence of a base or a Lewis acid, in a ring-opening process to provide 13,14-dihydro prostaglandin A, E, and F derivatives.		