

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
3 July 2003 (03.07.2003)

PCT

(10) International Publication Number
WO 03/053908 A1

(51) International Patent Classification⁷: **C07C 209/12**

(21) International Application Number: PCT/EP02/13755

(22) International Filing Date: 5 December 2002 (05.12.2002)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
0104346-2 21 December 2001 (21.12.2001) SE

(71) Applicant (*for all designated States except US*): **AKZO NOBEL NV** [NL/NL]; P.O. Box 9300, NL-6800 SB Arnhem (NL).

(72) Inventors; and

(75) Inventors/Applicants (*for US only*): **BAAN, Willem, Hendrikus** [NL/NL]; Dijkhuizenweg 6, NL-7397 NV Nijbroek (NL). **BERG, Jacobus, Van Den** [NL/NL]; Hoofdstraat 57-1, NL-3781 AS Voorthuizen (NL).

(74) Agent: **ANDERSSON, Rolf**; Akzo Nobel Surface Chemistry AB, S-444 85 Stenungsund (SE).

(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, 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, IE, IT, LU, MC, NL, PT, 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: PROCESS FOR THE CONTINUOUS QUATERNISATION OF TERTIARY AMINES WITH AN ALKYL HALIDE

(57) Abstract: The present invention relates to a continuous process for the quaternisation of tertiary amines with an alkyl halide. The process is performed at a temperature between 50 °C and 140 °C by reacting a tertiary amine and an alkyl halide in a tubular reactor at a pressure sufficient to keep the alkyl halide dissolved in the reaction mixture. The molar ratio between the tertiary amine and the alkyl halide is from 1:1.3 to 1:2.9 and the pressure is suitably between 12 to 65 bar. The process could be performed either with or without a solvent present, preferably without a solvent. The process gives high product yields and low amounts of by-products.



WO 03/053908 A1