

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
24 July 2003 (24.07.2003)

PCT

(10) International Publication Number
WO 03/059483 A3

- (51) International Patent Classification⁷: C07C 7/152, 7/156, 11/02, 11/12, 11/167
- (21) International Application Number: PCT/US02/41739
- (22) International Filing Date:
31 December 2002 (31.12.2002)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
10/037,044 31 December 2001 (31.12.2001) US
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- (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, 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, 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*
- (88) Date of publication of the international search report:
18 December 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.*



WO 03/059483 A3

(54) Title: SEPARATION OF DIENES FROM OLEFINS USING IONIC LIQUIDS

(57) Abstract: Methods for separating di-olefins from mono-olefins, and olefins from non-olefins such as paraffins, oxygenates and aromatics, are provided. The methods use metal salts which complex both mono-olefins and di-olefins, but which selectively complex di-olefins in the presence of mono-olefins. The metal salts are dissolved or suspended in ionic liquids, which tend to have virtually no vapor pressure. Preferred salts are Group IB salts, more preferably silver and copper salts. A preferred silver salt is silver tetrafluoroborate. A preferred copper salt is silver CuOTf. Preferred ionic liquids are those which form stable solutions, suspensions or dispersions of the metal salts, which do not dissolve unwanted non-olefins, and which do not isomerize the mono- or di-olefins. The equivalents of the metal salt can be adjusted so that di-olefins are selectively adsorbed from mixtures of mono- and di-olefins. Alternatively, both mono- and di-olefins can be adsorbed, and the mono-olefins selectively desorbed. The latter approach can be preferred when non-olefins are also to be separated. The mono- and di-olefin-containing mixture can be in the gas phase or in the liquid phase. The flow of mono- and di-olefin-containing mixture over/through the ionic liquid can be, for example, co-current, counter-current, or staged in stirred tanks, with countercurrent being preferred.