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| <b>(51) International Patent Classification 6 :</b><br>B01J 23/00, 23/02, 29/04, 29/06, 21/00,<br>C07C 4/12, 15/00                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  | <b>A1</b> | <b>(11) International Publication Number:</b><br><b>WO 98/51409</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |           | <b>(43) International Publication Date:</b> 19 November 1998 (19.11.98)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>(21) International Application Number:</b> PCT/US98/07400<br><b>(22) International Filing Date:</b> 13 April 1998 (13.04.98)<br><b>(30) Priority Data:</b><br>08/854,646 12 May 1997 (12.05.97) US<br><b>(71) Applicant:</b> PHILLIPS PETROLEUM COMPANY [US/US];<br>4th and Keeler, Bartlesville, OK 74004 (US).<br><b>(72) Inventors:</b> DRAKE, Charles, Alfred; Route 1, Box 206,<br>Nowata, OK 74048 (US). WU, An-Hsiang; 854 Concord<br>Drive, Bartlesville, OK 74006 (US).<br><b>(74) Agents:</b> WEST, Paul, B.; Ladas & Parry, 26 West 61st Street,<br>New York, NY 10023 (US) et al. |  |           | <b>(81) Designated States:</b> AL, AM, AT, AU, AZ, BA, BB, BG, BR,<br>BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE,<br>GH, GM, GW, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ,<br>LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW,<br>MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ,<br>TM, TR, TT, UA, UG, UZ, VN, YU, ZW, ARIPO patent<br>(GH, GM, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent<br>(AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent<br>(AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT,<br>LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI,<br>CM, GA, GN, ML, MR, NE, SN, TD, TG).<br><br><b>Published</b><br><i>With international search report.</i> |
| <b>(54) Title:</b> IMPROVED CATALYST COMPOSITION USEFUL FOR CONVERSION OF NON-AROMATIC HYDROCARBONS TO AROMATICS AND LIGHT OLEFINS                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>(57) Abstract</b><br><br>A novel zeolite catalyst comprising an acid treated zeolite impregnated with zinc and at least one other metal selected from the group consisting of Group 4B, Group 6B, Group 3A, Group 4A and Group 5A of the periodic table of elements, a method of making such zeolite catalyst, and the use thereof for converting paraffin hydrocarbons to olefins and aromatics with a low rate of coke formation during such conversion.                                                                                                                                    |  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |