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(57) Abstract: The present disclosure provides a process for removing metal contaminants from a contaminated fluid stream comprising the step of contacting said fluid stream with macroporous alpha alumina to obtain a fluid stream containing less than 50 ppm of metal. The fluid stream can be selected from the group consisting of a stream of mineral acid(s) and a stream of alkylene(s); and the metal contaminant can be at least one of elemental metals and metal oxides. The process further comprises a step of obtaining spent macroporous alpha alumina and regenerating active macroporous alpha alumina therefrom by washing said spent macroporous alpha alumina with at least one purified stream selected from the group consisting of a stream of mineral acid(s) and a stream of alkylene(s).

### INTERNATIONAL SEARCH REPORT

International application No. PCT/IN2014/000403

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According to International Patent Classification (IPC) or to both national classification and IPC

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Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

Questel Orbit, IPO internal

### C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2008/0257150 A1, BAYER MATERIALSCIENCE AG, 23 october, 2008(23-10-2008), Abstract, paras 0008-0016, claims 1-16	1-14
Y	US 2005/028672 A1, EMKOTEK VISALIA, 10 February, 2005(10-02-2005), abstract, para 0014-0015, claims 23-29	1-14
У	US 3411879 A, DOW CHEMICAL COMPANY, 19 November, 1968(19-11-1968), cited in the application Abstract, columns 1-2, example 1, claims 1-3	1-14
Y	US 2011/0079145 A1, BASF CATALYST, 07 April, 2011(07-04-2011), Abstract, paras 0001, 0010, claims 19-20	1-14

	Furthe	r documents are listed in the continuation of Box C.		See patent family annex.	
*	Special	categories of cited documents:	"T"	later document published after the international filing date or priority	
"A"	document defining the general state of the art which is not considered to be of particular relevance			date and not in conflict with the application but cited to understand the principle or theory underlying the invention	
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Information on patent family members

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Citation	Pub.Date	Family	Pub.Date
US 2008257150 A1	23-10-2008	KR 20090129476 A IN 5792/DELNP/2009 A JP 2010524814 A	16-12-2009 11-06-2010 22-07-2010
US 2005028672 A1 US 2011079145 A1	10-02-2005 07-04-2011	US 7014682 B2 WO 2011043974 A3 IN 4107/CHENP/2012 A EP 2485834 A4	21-06-2006 25-08-2011 30-08-2013 15-10-2014