

INTERNATIONAL SEARCH REPORT

International application No.

PCT/DE2019/101088

A. CLASSIFICATION OF SUBJECT MATTER <i>C07D 323/00</i> (2006.01)i		
According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED		
Minimum documentation searched (classification system followed by classification symbols) C07D		
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) EPO-Internal, WPI Data, CHEM ABS Data		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	HUI ZHOU ET AL. "Synthesis and alkaline earth metal cation extraction by proton di-ionizable p-tert-butylcalix[4]arene-crown-5 compounds in cone, partial-cone and 1,3-alternate conformations" <i>ORGANIC & BIOMOLECULAR CHEMISTRY</i> , Vol. 4, No. 6, 24 January 2006 (2006-01-24), page 1104 DOI: 10.1039/b517348e ISSN: 1477-0520, XP055666056 abstract page 1104; figure 1 page 1105; figures 2, 3; compounds 3e, 4e, 5e page 1107 compounds 4e, 5e page 1109; figures 6-8 page 1109, right column, last paragraph - page 1110, left column, paragraph 1	1-15
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C. <input checked="" type="checkbox"/> See patent family annex.		
<p>* Special categories of cited documents:</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier application or patent but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art</p> <p>"&" document member of the same patent family</p>		
Date of the actual completion of the international search 17 February 2020		Date of mailing of the international search report 25 February 2020
Name and mailing address of the ISA/EP European Patent Office p.b. 5818, Patentlaan 2, 2280 HV Rijswijk Netherlands Telephone No. (+31-70)340-2040 Facsimile No. (+31-70)340-3016		Authorized officer Dunet, Guillaume Telephone No.

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C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	TU ET AL. "Di-ionizable calix[4]arene-1,2-crown-5 and -crown-6 ethers in cone conformations: synthesis and divalent metal ion extraction" <i>TETRAHEDRON, ELSEVIER SCIENCE PUBLISHERS, AMSTERDAM, NL</i> , Vol. 64, No. 7, 22 November 2007 (2007-11-22), pages 1187-1196 DOI: 10.1016/J.TET.2007.11.065 ISSN: 0040-4020, XP022413089 abstract page 1189; compound 15 page 1190; figure 3	1-15
Y	HUI ZHOU ET AL. "Proton di-ionizable p-tert-butylcalix[4]arene-crown-6 compounds in cone, partial-cone and 1,3-alternate conformations: synthesis and alkaline earth metal cation extraction" <i>ORGANIC & BIOMOLECULAR CHEMISTRY</i> , Vol. 3, No. 9, 24 March 2005 (2005-03-24), page 1676 DOI: 10.1039/b501822f ISSN: 1477-0520, XP055666054 abstract page 1677; compound 1e page 1678; compounds 2e, 3e page 1679; figures 2, 3 page 1680; figure 6 page 1680, left column, paragraph 2 - paragraph 3	1-15
Y	HUI ZHOU ET AL. "Effect of para-substituents on alkaline earth metal ion extraction by proton di-ionizable calix[4]arene-crown-6 ligands in cone, partial-cone and 1,3-alternate conformations" <i>ORGANIC & BIOMOLECULAR CHEMISTRY</i> , Vol. 5, No. 2, 24 November 2006 (2006-11-24), pages 324-332 DOI: 10.1039/B611570E ISSN: 1477-0520, XP055666041 abstract page 325; compounds 5e, 6e, 7e, 8e, 9e, 10e pages 328-329; figures 6-10	1-15
Y	CHUQIAO TU ET AL. "Di-ionizable p-tert-butylcalix[4]arene-1,2-crown-5 and -crown-6 compounds in the cone conformation: synthesis and alkaline earth metal cation extraction" <i>ORGANIC & BIOMOLECULAR CHEMISTRY</i> , Vol. 4, No. 15, 30 June 2006 (2006-06-30), page 2938 DOI: 10.1039/b604218j ISSN: 1477-0520, XP055666036 abstract page 2939; compounds 11, 15 page 2940 - page 2941; figures 3, 4	1-15
Y	WO 9924081 A2 (BATTELLE MEMORIAL INSTITUTE [US]; IDAHO RES FOUND [US]) 20 May 1999 (1999-05-20) cited in the application abstract figures 1-16 claims 1-37	1-15

INTERNATIONAL SEARCH REPORT
Information on patent family members

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Patent document cited in search report	Publication date (day/month/year)	Patent family member(s)	Publication date (day/month/year)
WO 9924081 A2	20 May 1999	US 6117413 A	12 September 2000
		WO 9924081 A2	20 May 1999