



- (51) **International Patent Classification:**
C07D 473/34 (2006.01) A61K 31/52 (2006.01)
- (21) **International Application Number:**
PCT/IB2015/060069
- (22) **International Filing Date:**
31 December 2015 (31.12.2015)
- (25) **Filing Language:** English
- (26) **Publication Language:** English
- (30) **Priority Data:**
6844/CHE/2014 31 December 2014 (31.12.2014) IN
2493/CHE/2015 18 May 2015 (18.05.2015) IN
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- (81) **Designated States** (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JP, KE, KG, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.
- (84) **Designated States** (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).
- Published:**
- with international search report (Art. 21(3))
 - before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))
- (88) **Date of publication of the international search report:**
18 August 2016



WO 2016/108206 A3

(54) **Title:** PROCESSES FOR PREPARATION OF IDELALISIB AND INTERMEDIATES THEREOF

(57) **Abstract:** The present application provides processes for preparation of Idelalisib and intermediates thereof. The present application also provides a process for purification of Idelalisib.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/IB2015/060069

A. CLASSIFICATION OF SUBJECT MATTER C07D473/34,A61K31/52 Version=2016.01		
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, A61K		
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) Patseer, IPO Internal Database		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO2005113556A1 by Icos Corporation; Dec 1, 2005 (01/12/2005) abstract, field of the invention and elsewhere	claims 13 & 15-16
A	WO2005113554A2 by Icos Corporation; Dec 1, 2005 (01/12/2005) summary of the invention	claim 1-4, 9 and 11-12 & 14
<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input checked="" type="checkbox"/> See patent family annex.		
* Special categories of cited documents:		
"A" document defining the general state of the art which is not considered to be of particular relevance	"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	
"E" earlier application or patent but published on or after the international filing date	"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	
"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)	"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	
"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family	
"P" document published prior to the international filing date but later than the priority date claimed		
Date of the actual completion of the international search 09-06-2016	Date of mailing of the international search report 09-06-2016	
Name and mailing address of the ISA/ Indian Patent Office Plot No.32, Sector 14,Dwarka,New Delhi-110075 Facsimile No.	Authorized officer Sudipta Dey Telephone No. +91-1125300200	

INTERNATIONAL SEARCH REPORT

International application No.
PCT/IB2015/060069**Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)**

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

Gr 1: Claim 1-3(part), claim 4, claim 9(part) and claim 11-16(part)

The subject matter of claims of Gr 1 relates to purification (claim 1-3), its preparation by using a compound of formula II, IV, V, VI & VII (claim 4), intermediate compounds (claim 9) and use of the Idelalisib (claim 11-16).

Gr 2: Claim 1-3(part), claim 5, claim 9(part) and claim 11-16(part)

The subject matter of claims of Gr 2 relates to purification (claim 1-3), its preparation by using a compound of formula II, II-A, &

1. As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of additional fees.
3. As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:
Claim 1-3(part), claim 4, claim 9(part) and claim 11-16(part)

Remark on Protest

- The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/IB2015/060069

Citation	Pub.Date	Family	Pub.Date
WO 2005113556 A1	01-12-2005	US 20120015964 A1	19-01-2012
		CA 2566609 C	26-06-2012
		EP 2612862 A3	08-01-2014
WO 2005113554 A2	01-12-2005	CN 101031569 A	05-09-2007
		EP 2612862 A2	10-07-2013
		US 8980901 B2	17-03-2015

INTERNATIONAL SEARCH REPORT

International application No.

PCT/IB2015/060069

Continuation of Observations where unity of invention is lacking(Box III)

VII-A (claim 5), intermediate compounds (claim 9) and use of the Idelalisib (claim 11-16).

Gr 3: Claim 1-3(part), claim 6, claim 8, claim 9(part) and claim 11-16(part)

The subject matter of claims of Gr 3 relates to purification (claim 1-3), its preparation by using a compound of formula VII, IX, I-C & 1-E (claim 6), intermediate compounds (claim 8 & 9) and use of the Idelalisib (claim 11-16).

Gr 4: Claim 1-3(part), claim 7, claim 9(part), claim 10 and claim 11-16(part)

The subject matter of claims of Gr 4 relates to purification (claim 1-3), its preparation by using a compound of formula IX, X, XI & XII (claim 7), intermediate compounds (claim 9) and use of the Idelalisib (claim 11-16).

The common technical feature (CTF) among all the above classified groups is Idelalisib which is already known in the art US7932260B2 (applicant cited). Hence it cannot be considered as special technical feature (STF) and in absence of any STF

Any common technical feature (CTF) has not been found among the above classified groups of inventions and hence the invention of Gr 1, Gr 2, G 3 & Gr 4 has been considered as separate invention, and it does not meet the requirement of PCT Rule 13.1. Moreover, if the applicant wishes to argue that here the CTF is Idelalisib then also the CTF cannot be considered as special technical feature (STF) as it already exist in the prior art (US7932260B2 -Applicant cited), and for that instance unity of invention can't be acknowledged.