

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
1 November 2001 (01.11.2001)

PCT

(10) International Publication Number
WO 01/080906 A3

- (51) International Patent Classification⁷: **A61K 51/04**
- (21) International Application Number: PCT/CA01/00558
- (22) International Filing Date: 20 April 2001 (20.04.2001)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
60/198,615 20 April 2000 (20.04.2000) 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, 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, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW.
- (84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).
- Published:**
— with international search report
— before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments
- (88) Date of publication of the international search report:
10 October 2002
- (15) Information about Correction:
Previous Correction:
see PCT Gazette No. 08/2002 of 21 February 2002, Section II
- 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 01/080906 A3

(54) Title: RADIOMETAL COMPLEXES OF 2-PYRROLYLTHIONES FOR IMAGING A THERAPY

(57) Abstract: Novel 2-pyrrolylthione derived metal chelate compounds are disclosed as imaging and therapeutic agents. Compositions and methods for their preparation and use as diagnostic imaging and therapeutic agents are also disclosed.

INTERNATIONAL SEARCH REPORT

International Application No

PCT/CA 01/00558

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 A61K51/04

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)

IPC 7 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 practical, search terms used)

EPO-Internal, WPI Data, PAJ, BIOSIS, MEDLINE

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	BRUECKNER C ET AL: "2-PYRROLYLTHIONES AS MONOANIONIC BIDENTATE N,S-CHELATORS: SYNTHESIS AND MOLECULAR STRUCTURE OF 2-PYRROLYLTHIONATO COMPLEXES OF NICKEL(II), COBALT(III), AND MERCURY(II)" INORGANIC CHEMISTRY, AMERICAN CHEMICAL SOCIETY, EASTON, US, no. 39, 2000, pages 6100-6106, XP001076686 ISSN: 0020-1669 see scheme 1 page 6101, column 1 --- -/--	1,8,11, 13,17

 Further documents are listed in the continuation of box C. Patent family members are listed in annex.

° Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *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)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *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
- *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
- *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.
- *&* document member of the same patent family

Date of the actual completion of the international search

27 May 2002

Date of mailing of the international search report

22/08/2002

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INTERNATIONAL SEARCH REPORT

International Application No

PCT/CA 01/00558

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	CLEZY P S ET AL: "THE CHEMISTRY OF PYRROLIC COMPOUNDS//VIII. DIPYRRYLTHIONES" AUSTRALIAN JOURNAL OF CHEMISTRY, XX, XX, no. 22, 1969, pages 239-249, XP008002984 ISSN: 0004-9425 cited in the application page 242 see compounds formula IVa-IVf page 240, paragraph 2 ---	13
P,X	SELIVANOVA S.V. ET AL: "The synthesis and properties of new 2-pyrrolylthiones as chelating agents for transition metals and technetium" BIORGANIC&MEDICINAL CHEMISTRY LETTERS, vol. 11, 2001, pages 2697-2699, XP002197809 the whole document ---	1-17
P,X	SELIVANOVA S V ET AL: "SYNTHESIS OF SUBSTITUTED 2-PYRROLYLTHIONES AS LIGANDS FOR 99MTC" JOURNAL OF NUCLEAR MEDICINE, SOCIETY OF NUCLEAR MEDICINE. NEW YORK, US, vol. 5, SUPPL, no. 41, May 2000 (2000-05), page 149P, AN587 XP001068204 ISSN: 0161-5505 abstract -----	1-16

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CA 01/00558

Box I Observations where certain claims were found unsearchable (Continuation of item 1 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.: **1-17 partially**
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:
see FURTHER INFORMATION sheet PCT/ISA/210

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 II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

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

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 an additional fee, this Authority did not invite payment of any additional fee.

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.:

Remark on Protest

- The additional search fees were accompanied by the applicant's protest.
- No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box I.2

Claims Nos.: 1-17 partially

Present claims 1-17 relate to an extremely large number of possible compounds. Support within the meaning of Article 6 PCT and/or disclosure within the meaning of Article 5 PCT is to be found, however, for only a very small proportion of the compounds claimed. The claimed compounds include agents falling under the formula of claim 1, or precursors under the formula of claim 13 having "radioisotopes from the group of and the like", "R1, R2, R3 is : alkyl, OH or its derivative,... acid ester group or its derivative,, SO3H or its derivative ", "R is: alkyl, OH or its derivative,... acid ester group or its derivative,, SO3H or its derivative", "X is unsubstituted or substituted alkyl or heteroalkyl, unsubstituted or substituted carbocycle, unsubstituted or substituted heterocycle", "A is alkyl, heteroalkyl, carbocycle or heterocycle"

In the present case, the claims so lack support, and the application so lacks disclosure, that a meaningful search over the whole of the claimed scope is impossible.

The claims cover all compounds having these characteristics or properties, whereas the application provides support within the meaning of Article 6 PCT and disclosure within the meaning of Article 5 PCT for only a very limited number of such compounds. In the present case, the claims so lack support, and the application so lacks disclosure, that a meaningful search over the whole of the claimed scope is impossible.

Independent of the above reasoning, the claims also lack clarity (Article 6 PCT). An attempt is made to define the compound by reference to a result to be achieved. Again, this lack of clarity in the present case is such as to render a meaningful search over the whole of the claimed scope impossible.

Consequently, the search has been carried out for those parts of the claims which appear to be supported and disclosed, namely those parts relating to the compounds and precursors prepared in the examples and those compounds depicted in figures 1-4 and pyrrol and pyrrolyl thiones with the specific substituents recited in claim 5, 8-10 in combination with a radioisotope selected from Tc, Re, Cd, Pb, Zn, Ag, Au, Ga, Pt, Pd, Rh, Cr, Cu or V.

The applicant's attention is drawn to the fact that claims, or parts of claims, relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure.