

Art Unit 1203

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Appeal No. 93-0842

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ON BRIEF

PAT. & T.M. OFFICE
BOARD OF PATENT APPEALS
AND INTERFERENCES

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte Arthur P. Schaap

Application for Patent filed December 27, 1988, Serial No. 07/289,837, which is a continuation-in-part of Serial No. 06/887,139 filed July 17, 1986. Enhanced Chemiluminescence From 1,2-Dioxetanes Through Energy Transfer To Tethered Fluorescers.

Ian C. McLeod for appellant.

Supervisory Patent Examiner - C. Warren Ivy.
Examiner - C. Scalzo.

Before Meros, J. Smith and Garris, Examiners-in-Chief.

J. Smith, Examiner-in-Chief.

This is an appeal from the final rejection of claims 1 through 3, 6 through 8, 14, and 75. Claims 27, 30, 35, and 37 are allowed. Claims 12, 15-18 are objected to but would be allowable in independent format. Claims 4, 5, and 9-11, 13, 19-26, 28, 29, 31-34, 36 and 38-74 stand withdrawn from further consideration as directed to non-elected inventions.

Claims 1 and 2 are representative and are reproduced in the attached appendix.

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The subject matter on appeal is directed to a class of compounds referred to as "triggerable" 1,2-dioxetanes which are compounds which contain a reactive 4-membered peroxide ring. Such compounds are especially useful in diagnostic assays where the dioxetane is triggered by an activating agent (e.g., an enzyme or a base) to produce light. As distinguished from prior art compounds, those claimed here contain a fluorescent substituent (FLUOR) at the R₃ position which is said to enhance the chemiluminescent efficiencies.

No prior art rejections are before us. However, the examiner has rejected the appealed claims under 35 U.S.C. § 112, first and second paragraphs.

In her Answer, the examiner enumerates a multiplicity of reasons as to why the appealed claims run afoul of 35 U.S.C. § 112. More specifically, the examiner characterizes the claims as "unclear and vague" because it is impossible to know exactly what is encompassed by the claim language relating to the R₁, R₂ and R₃ groups, the "X" groups, the fluorescent groups, the Ar moiety, the "POLY" group, and the "FLUOR" group. Additionally, the examiner considers the expression "tethered fluorescent substituent" (claim 1) to be unclear along with the claim language regarding the decomposition of the compounds.

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The examiner also considers that the claims to run afoul of the enablement requirement of 35 U.S.C. § 112 because the phrase "which allow the production of light" (claim 1) is broader than the scope of enablement. Finally, the examiner states that the enormous apparent scope of the claims is unsupported because the appellant does not enable many of the compounds claimed. Thus, the examiner considers that each of the rejected appealed claims to be broader than the scope of enablement. In support of this rejection, the examiner argues that the art in question involves a high degree of unpredictability (Answer, page 4).

OPINION

Insofar as the examiner's § 112 criticisms are grounded in the second paragraph of 35 U.S.C. § 112, we reverse. By now it is clear that the definiteness of language used in a claim must be analyzed, not in a vacuum as here, but always in light of the teachings of the prior art and the disclosures of the application, as it would be interpreted by one having ordinary skill in the relevant art. *In re Moore*, 439 F.2d 1232, 169 USPQ 236 (CCPA 1971). Thus, as noted by appellant in the Brief, page 3, the specification describes numerous examples of each of the chemical groups that are objected to. For example, see the disclosure of the specification in the paragraph bridging pages

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16-17 for examples of the "FLUOR" substituent. With respect to the X moiety, compare the specification at page 18. It is true that the claims, particularly claim 1, are defined with considerable breadth. But breadth is not synonymous with indefiniteness. *In re Gardner*, 427 F.2d 786, 166 USPQ 138 (CCPA 1970). *In re Wakefield*, 422 F.2d 897, 164 USPQ 636 (CCPA 1970).

Based on the foregoing, to the extent that the claims are rejected under 35 U.S.C. § 112, second paragraph, we reverse the examiner's rejections.

We now turn to the examiner's rejection of the appealed claims based on the enablement portion of 35 U.S.C. § 112. As noted earlier, the examiner considers the enormous scope of the claims to be unsupported and nonenabling as to many of the compounds included within the claims. Thus, the examiner characterizes the claims as being "broader than the scope of enablement." This specific criticism was first clearly set forth as a new ground of rejection in the Answer.

In response to the above specific rejection of the claims, appellant simply states (Reply Brief, page 2) that such criticism is "certainly not true of claims 2, 3, 7, 8, and 14."

In considering this issue, we note that a patent applicant is not required to disclose every species encompassed by his claims, even in an unpredictable art. *In re Angstadt*, 537 F.2d 498, 190 USPQ 214 (CCPA 1976). However, there must be

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sufficient disclosure, either through illustrative examples or terminology to teach those of ordinary skill in the art how to make and use the invention as broadly as it is claimed.

In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

Applying the general guidelines above to the claims and the facts before us, we agree with appellants that claims 2, 3, 7, 8, and 14 are free of this criticism. In this regard, we point out that independent claim 2 and those dependent thereon define the "POLY" group specifically as a spirofused polycyclic alkylene group containing 6 to 30 carbon atoms and optionally containing atoms selected from the group consisting of oxygen and nitrogen in place of a carbon atom. Additionally and importantly, the "X" leaving group is specifically defined by a Markush listing of specific moieties. As set forth earlier, descriptive support for each of the "X" leaving groups is found in the originally filed specification. Further, there are five specific compounds exemplified in the specification covered by the appealed claims. Accordingly, we reverse the examiner's "broader than the enabling disclosure" rejection as to the above claims.

We reach a different result, however, with respect to claims 1, 6, and 75. As noted above, appellant has presented no substantive arguments as to why these claims are not properly rejected and, indeed, appellant appears to have conceded that the

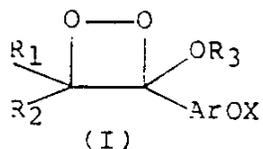
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rejection as to these claims is appropriate. Moreover, comparing independent claim 1 to independent claim 2, it is immediately seen that claim 1 is much more broadly defined with respect to the "X" leaving group and the R₁, R₂ groups. Particularly, as seen from the specification at page 6, profound effects of various functional groups on the properties of the dioxetanes are present with respect to the "X" moiety. Accordingly, it is not apparent that the disclosure here adequately guides the art worker to determine, without undue experimentation, which "X" species among all those encompassed by that claimed term in claim 1 (i.e., "a leaving group") would possess the disclosed utility. Accordingly, we find that the examiner has properly rejected claims 1, 6, and 75 as being broader than the enabling disclosure under 35 U.S.C. § 112, first paragraph, and we affirm this rejection.

In summary, we affirm the examiner's rejection of claims 1, 6, and 75 as being broader than the enabling disclosure under 35 U.S.C. § 112, first paragraph. All other rejections are reversed.

Accordingly, the decision of the examiner is affirmed-in-part.

A dioxetane compound of the formula:



wherein R_1 and R_2 are carbon atom containing groups containing 6 to 30 carbon atoms and optionally containing an atom selected from the group consisting of oxygen, nitrogen and sulfur atoms in place of a carbon atom which allow the production of light from the dioxetane,

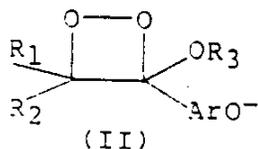
wherein R_3 is a tethered fluorescent substituent wherein the fluorescent substituent exhibits fluorescence between approximately 400 and 900 nanometers,

wherein optionally R_1 and R_2 are joined together,

wherein optionally R_3 and ArOX are joined together,

wherein X is a leaving group,

wherein compound (I) decomposes to form an aryl oxide (II) of the formula

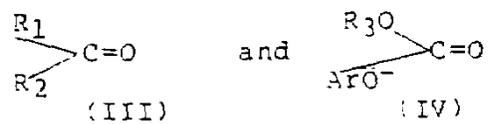


when reacted with an activating agent which removes X,

wherein the aryl oxide (II) spontaneously decomposes to form compounds (III) and (IV) of the

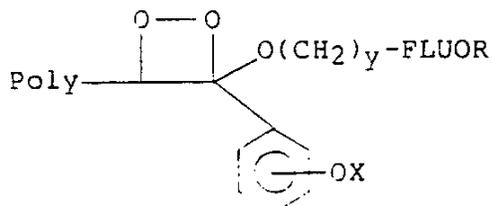
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formulae:



and wherein the fluorescent substituent is activated to produce light upon the decomposition of the aryl oxide.

A dioxetane compound of the formula:



wherein Poly is a spirofused polycyclic alkylene group containing 6 to 30 carbon atoms and optionally containing atoms selected from the group consisting of oxygen and nitrogen in place of a carbon atom,

wherein FLUOR is a fluorescent substituent containing group wherein the fluorescent substituent exhibits fluorescence between 400 and 900 nanometers,

wherein y is an integer between 1 and 14, and

wherein X is a leaving group selected from the group consisting of hydroxyl, alkyl or aryl carboxyl ester, inorganic oxyacid salt, alkyl or aryl silyloxy and oxygen pyranoside and wherein aryl is a single ring, which when removed by an activating agent produces an oxide intermediate of the dioxetane compound which spontaneously decomposes to form light because of FLUOR and carbonyl

containing molecules of the formulae

