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**WO 02/000920 A3**

(54) Title: INGESTIBLES POSSESSING INTRINSIC COLOR CHANGE

(57) Abstract: Ingestible compositions comprising a chromic change agent together with methods of making and using them are provided. The chromic change agent alternatively may be associated with the ingestible, such as a packaging material for the ingestible. In response to a triggering event, physical or chemical, the chromic change agent changes color to provide information as to the history of the ingestible, either prior or contemporaneous with use. Depending on the use, the color change agent may be reversible or irreversible. Various solid or liquid ingestible compositions are provided for determining ingestible temperature, storage temperature, user temperature, light exposure, pH change, hydration or solvation change, mechanical stress, and the like, particularly in comestibles. Of particular interest are polydiacetylene polymers that may be formulated to provide compositions having numerous different color transition triggering mechanisms. The invention is also related to other chromic change agents that may be incorporated into ingestibles.

INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 01/20260

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 G01N31/22 G01K11/16 G01N33/02 A61K7/16

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 G01K G01N

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)

WPI Data, PAJ, EPO-Internal, FSTA, BIOSIS, COMPENDEX, 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.
X	US 3 309 274 A (HERBERT BRILLIANT) 14 March 1967 (1967-03-14) column 1, paragraph 1 column 1, paragraph 5 column 1, last paragraph -column 2, paragraph 2	1-3,6,8, 12,79-82
X	US 4 847 066 A (HONIGS DAVID E ET AL) 11 July 1989 (1989-07-11) column 1, line 55 -column 2, line 36 column 2	1,3,79, 81,82
A	US 4 737 463 A (BHATTACHARJEE HIMANGSHU R ET AL) 12 April 1988 (1988-04-12)  abstract	1-3,6,8, 12, 44-49, 79-82

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

6 February 2002

Date of mailing of the international search report

24.05.02

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## INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 01/20260

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>ZHANFANG MA ET AL.: "Colorimetric Detection of Escherichia coli by polydiacetylen vesicles fonctionalized with glycolipid" JOURNAL OF THE AMERICAN CHEMICAL SOCIETY, vol. 120, no. 48, 18 November 1998 (1998-11-18), pages 12678-12679, XP002189310 the whole document -----</p>	

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US 01/20260

## 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.:  
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 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:

see additional sheet

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.:

1-4(in part),6(in part),8,12(in part)44-49(in part),79-82(in part)

### 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

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-4 (in part), 6(in part), 8, 12(in part),  
44-49(in part), 79-82(in part)

An ingestible comprising a chromic change agent wherein colour change is triggered by light.

2. Claims: 1-4 (in part), 6(in part), 12(in part), 13, 14,  
44-49(in part), 79-82(in part)

An ingestible comprising a chromic change agent wherein colour change is triggered by mechanical stress.

3. Claims: 1-4(in part), 5, 6(in part), 7, 12(in part), 15-35,  
44-49(in part), 51(in part), 53-54(in part), 55, 57-62,  
63-67(in part), 79-82(in part)

An ingestible comprising a chromic change agent wherein colour change is triggered by temperature.

4. Claims: 1-4 (in part), 6(in part), 12(in part),  
44-49(in part), 79-82(in part)

An ingestible comprising a chromic change agent wherein colour change is triggered by a change of pH.

5. Claims: 1-4 (in part), 6(in part), 12(in part),  
44-49(in part), 56, 79-82(in part)

An ingestible comprising a chromic change agent wherein colour change is triggered by a change in hydration.

6. Claims: 1-4 (in part), 6(in part), 12(in part),  
44-49(in part), 79-82(in part)

An ingestible comprising a chromic change agent wherein colour change is triggered by a change in solvation.

7. Claims: 1-4 (in part), 6(in part), 12(in part),  
44-49(in part), 79-82(in part)

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

An ingestible comprising a chromic change agent wherein colour change is triggered by a change of ionization potential.

8. Claims: 1-4 (in part),6(in part),9,12(in part),  
44-49(in part),79-82(in part)

An ingestible comprising a chromic change agent wherein colour change is triggered by a change of solvents.

9. Claims: 1-4 (in part),6(in part),10,11,12(in part),  
44-49(in part),79-82(in part),83,84

An ingestible comprising a chromic change agent wherein colour change is triggered by a change in chemical constituents.

10. Claims: 36,37,50,51(in part),52,53-54(in part)

A material in contact with food comprising a diacetylenic compound.

11. Claims: 38-42,63-67(in part)

An ingestible comprising a diacetylenic compound that indicates freshness or safe status.

12. Claims: 43,63-67(in part)

An ingestible comprising a diacetylenic compound comprising as an end group a carboxylic acid, a hydroxy group or an amino group

13. Claims: 68-77

A diagnostic device comprising at least a chromic change agent.

14. Claim : 78

A method for written or graphical communication displayed on an ingestible comprising applying at least two chromic change agents.

INTERNATIONAL SEARCH REPORT  
Information on patent family members

International Application No  
PCT/US 01/20260

Patent document cited in search report		Publication date		Patent family member(s)		Publication date
US 3309274	A	14-03-1967	CA	944693 A1		02-04-1974
US 4847066	A	11-07-1989	US	4746616 A		24-05-1988
US 4737463	A	12-04-1988	NONE			