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(54) **Fire extinguishing compositions.**

(57) A fire extinguishing composition comprising at least one fire extinguishing compound selected from the isomers of dichloropentafluoropropane, a fire extinguishing device containing said composition and a method of extinguishing a fire using said composition.

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The present invention relates to fire extinguishing compositions, to fire extinguishing devices containing such compositions and to a method of extinguishing a fire using such compositions.

In view of the concern surrounding possible damage to the ozone layer by certain halocarbons, a need has arisen to find alternative fire extinguishing compositions. While fire extinguishing compositions known in the art provide effective fire extinguishing performance, the use of such compositions may have a destructive effect on the ozone layer.

The problem which the present invention sets out to solve is, therefore, to provide a fire extinguishing composition which exhibits good fire extinguishing performance and is relatively ozone benign.

According to the first aspect of the present invention there is provided a fire extinguishing composition comprising at least one fire extinguishing compound selected from the isomers of dichloropentafluoropropane.

According to the second aspect of the present invention there is provided a fire extinguishing device containing the fire extinguishing composition of the first aspect.

According to a third aspect of the present invention there is provided a method of extinguishing a fire which method comprises administering to said fire an effective amount of a fire extinguishing composition comprising at least one fire extinguishing compound selected from the isomers of dichloropentafluoropropane.

The isomers of dichloropentafluoropropane are those having the empirical formula $C_3F_5Cl_2H$, such as 1,1-dichloro-2,2,3,3,3-pentafluoropropane and 1,3-dichloro-1,2,2,3,3-pentafluoropropane. The fire extinguishing composition may comprise a single isomer of dichloropentafluoropropane or a mixture of such isomers. A particularly preferred isomer is 1,1-dichloro-2,2,3,3,3-pentafluoropropane and, accordingly, in a preferred fire extinguishing composition of the invention the at least one fire extinguishing compound selected from the isomers of dichloropentafluoropropane comprises at least a major proportion, e.g. at least 50 % by weight, of the 1,1-dichloro-2,2,3,3,3-pentafluoropropane isomer. More preferably, the at least one isomer of dichloropentafluoropropane contained in the fire extinguishing composition is entirely 1,1-dichloro-2,2,3,3,3-pentafluoropropane.

In addition to the at least one isomer of dichloropentafluoropropane, the fire extinguishing compositions of the invention may further comprise one or more other fire extinguishing compounds, such as a completely halogenated fluorobromoalkane or fluorobromochloroalkane. Examples of such compounds include, inter alia, dibromodifluoromethane,

bromotrifluoromethane, and bromochlorodifluoromethane. Other suitable fire extinguishing compounds which may be included in the fire extinguishing compositions of the invention include those disclosed in the present applicants European patent application EP-383 443 A2, e.g. 1-bromo-1,2,2,2-tetrafluoroethane.

The fire extinguishing compositions of the invention may optionally comprise one or more coadjuvant agents having a boiling point below $0^\circ C$ (hereinafter referred to as coadjuvants), which may enhance the effectiveness of the fire extinguishing compositions, e.g. on delivery from a fire extinguishing device. Preferred coadjuvants are the haloalkanes, especially the haloethanes and halomethanes, having a boiling point below $0^\circ C$, preferred examples of which are chlorodifluoromethane, 1,1,2,2-tetrafluoroethane and 1,1,1,2-tetrafluoroethane. Other suitable coadjuvants include the heptafluoropropanes, e.g. 1,1,1,2,3,3,3-heptafluoropropane. The use of a coadjuvant is, however, not essential, since the fire extinguishing compositions of the invention may be effectively delivered from a fire extinguishing device by the use of a standard gaseous propellant.

The fire extinguishing compositions of the invention will normally comprise at least 50 % by weight, preferably at least 70 % by weight and especially at least 90 % by weight of the at least one fire extinguishing compound selected from the isomers of dichloropentafluoropropane.

The fire extinguishing compositions of the invention will normally be delivered from fire extinguishing devices by means of a gaseous propellant. Suitable propellants are compounds of low toxicity and high stability, preferred examples of which are nitrogen and carbon dioxide. A particularly preferred propellant for delivery of the fire extinguishing compositions of the invention is carbon dioxide, since this has been found to provide a particularly effective delivery of the fire extinguishing compositions of the invention. The fire extinguishing composition is typically pressurised in the fire extinguishing device with 150 to 250 psi of the gaseous propellant.

The present invention is now illustrated, but not limited, by the following examples.

Example 1

A Committee European Normalisation (CEN) 11B fire was started using 11 litres of n-heptane as the fuel. The fire was extinguished in 4 seconds with 550 g of a fire extinguishing composition comprising 1,1-dichloro-2,2,3,3,3-pentafluoropropane discharged in 8 seconds from a 760 ml Thorn extinguisher containing 750 g of the composition pressurised to 200 psi with carbon dioxide.

Example 2

A Committee European Normalisation (CEN) 11B fire was started using 11 litres of n-heptane as the fuel. The fire was extinguished in 2.5 seconds with 400 g of a fire extinguishing composition of 1,1-dichloro-2,2,3,3,3-pentafluoropropane discharged in 8 seconds from a 760 ml Thorn extinguisher containing 750 g of the composition pressurised to 160 psi with carbon dioxide.

Claims

1. A fire extinguishing composition comprising at least one fire extinguishing compound selected from the isomers of dichloropentafluoropropane. 15
2. A fire extinguishing composition as claimed in claim 1 wherein the at least one fire extinguishing compound selected from the isomers of dichloropentafluoropropane comprises at least a major proportion of the 1,1-dichloro-2,2,3,3,3-pentafluoropropane isomer. 20
3. A fire extinguishing composition as claimed in claim 2 wherein the 1,1-dichloro-2,2,3,3,3-pentafluoropropane isomer constitutes at least 50 % by weight of the at least one fire extinguishing compound selected from the isomers of dichloropentafluoropropane. 25
4. A fire extinguishing composition as claimed in any one of the preceding claims which further comprises at least one other fire extinguishing compound. 30
5. A fire extinguishing composition as claimed in any one of the preceding claims which further comprises at least one coadjuvant agent having a boiling point below 0 °C. 35
6. A method of extinguishing a fire which method comprises administering to said fire an effective amount of a fire extinguishing composition comprising at least one fire extinguishing compound selected from the isomers of dichloropentafluoropropane. 40
7. A method of extinguishing a fire as claimed in claim 6 wherein the at least one fire extinguishing compound selected from the isomers of dichloropentafluoropropane contained in the fire extinguishing composition administered to the fire comprises at least a major proportion of the 1,1-dichloro-2,2,3,3,3-pentafluoropropane isomer. 45
8. A method as claimed in claim 7 wherein the 1,1-dichloro-2,2,3,3,3-pentafluoropropane isomer constitutes at least 50 % by weight of the at least one fire extinguishing compound selected from the isomers of dichloropentafluoropropane contained in the fire extinguishing composition administered to the fire. 50
9. A fire extinguishing device containing a fire extinguishing composition as claimed in any one of claims 1 to 5. 55
10. A fire extinguishing device as claimed in claim 9 containing a gaseous propellant to effect delivery of the said fire extinguishing composition from the fire extinguishing device.
11. A fire extinguishing device as claimed in claim 10 wherein the gaseous propellant is carbon dioxide.



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EUROPEAN SEARCH REPORT

Application Number

EP 91 30 8804

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
Y	WORLD PATENTS INDEX LATEST Week 8941, 15 April 1989 Derwent Publications Ltd., London, GB; AN 89-299513 & SU-A-1 472 073 (VAISMAN M N) * abstract ** -- --	1-11	A 62 D 1/00
Y	WORLD PATENTS INDEX LATEST Week 9039, 16 August 1990 Derwent Publications Ltd., London, GB; AN 890025685 & JP-A-2 207 047 (ASAHI GLASS KK) * abstract ** -- --	1-11	
Y	WORLD PATENTS INDEX LATEST Week 9039, 21 August 1990 Derwent Publications Ltd., London, GB; AN 90-295612 & JP-A-2 208 930 (ASAHI GLASS KK) * abstract ** -- --	1-11	
P,X	WO-A-9 104 766 (E.I. DU PONT DE NEMOURS AND COMPANY) * page 5, line 18 * * claims 1-12 ** -- -- -- --	1-11	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			A 62 D
Place of search		Date of completion of search	Examiner
The Hague		07 January 92	DALKAFUOKI A.
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