DESCRIPTION

TITLE OF INVENTION:

Composition for Heat Transfer Fluid, Heat Transfer Fluid, Heat Transfer Apparatus, and Heat Transfer Method

TECHNICAL FIELD

[0001] The present disclosure relates to a composition for heat transfer fluid, a heat transfer fluid, a heat transfer apparatus, and a heat transfer method.

BACKGROUND ART

[0002] It is known that hexafluoropropene (HFP) trimers are usable as heat transfer fluid (PTL 1).

[0003] Having low global warming potential (GWP) and low toxicity, HFP trimers have been receiving attention as a replacement for chlorofluorocarbon (CFC) and hydrochlorofluorocarbon (HCFC).

CITATION LIST

PATENT LITERATURE

[0004] PTL 1: Japanese National Patent Publication No. 2020-514420

PTL 2: Chinese Patent Application Publication No. 11354894

SUMMARY

TECHNICAL PROBLEM

[0005] Heat transfer fluid can be used in the semiconductor production process for the purpose of removing heat, but there is a risk that heat transfer fluid can be vaporized when the boiling point is low, and can leak from the apparatus.

[0006] The present disclosure aims at providing a heat transfer fluid having a relatively high boiling point.

SOLUTION TO PROBLEM

[0007] The present disclosure includes:

[1] A composition for heat transfer fluid, the composition comprising: hexafluoropropene trimers represented by formulae (I) to (III) below:

[7] Use of the composition for heat transfer fluid according to any one of [1] to [3] above or the heat transfer fluid according to [4] or [5] above for transferring heat.

[8] A heat transfer apparatus comprising:

a device; and

a mechanism for transferring heat to the device or from the device, wherein the mechanism comprises the composition for heat transfer fluid according to any one of [1] to [3] above or the heat transfer fluid according to [4] or [5] above.

[9] The heat transfer apparatus according to [8] above, wherein the device is a wafer for use in semiconductor production.

[10] A semiconductor production apparatus comprising the heat transfer apparatus according to [8] or [9] above.

[11] A heat transfer method comprising:

preparing a device; and

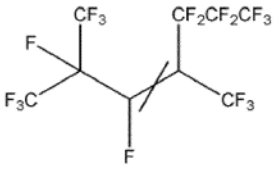
transferring heat to the device or from the device by using the composition for heat transfer fluid according to any one of [1] to [3] above or the heat transfer fluid according to [4] or [5] above.

[12] The heat transfer method according to [11] above, wherein the device is a wafer for use in semiconductor production.

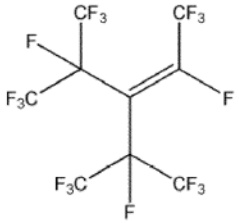
[0007a] In one aspect, the present disclosure provides a composition for heat transfer fluid, the composition comprising:

hexafluoropropene trimers represented by formulae (I) to (III) below:

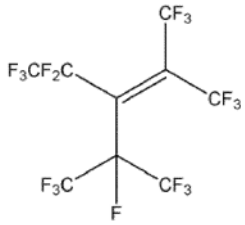
[Chem. 1]



(I)



(II)



(III)

wherein a compound represented by the formula (I) is contained in not less than 10 mass% and less than 85 mass% relative to a total amount of compounds represented by the formulae (I) to (III).

[0007b] In another aspect, the present disclosure provides a heat transfer fluid comprising the composition for heat transfer fluid as defined herein.

[0007c] In another aspect, the present disclosure provides use of the composition for heat transfer fluid as defined herein or the heat transfer fluid as defined herein for transferring heat.

[0007d] In another aspect, the present disclosure provides a heat transfer apparatus comprising:

a device; and

a mechanism for transferring heat to the device or from the device, wherein the mechanism comprises the composition for heat transfer fluid as defined herein or the heat transfer fluid as defined herein.

[0007e] In another aspect, the present disclosure provides a semiconductor production

apparatus comprising the heat transfer apparatus as defined herein.

[0007f] In another aspect, the present disclosure provides a heat transfer method comprising:

preparing a device; and

transferring heat to the device or from the device by using the composition for heat transfer fluid as defined herein or the heat transfer fluid as defined herein.

ADVANTAGEOUS EFFECTS OF INVENTION

[0008] The present disclosure provides a heat transfer fluid having a relatively high boiling point.

DESCRIPTION OF EMBODIMENTS

[0009] In the present specification, a numerical range "(from) A to B" is intended to include both the lower limit numerical value and the upper limit numerical value. In other words, a numerical range "(from) A to B" means not less than A and not more than B.

[0010] In the following, a description will be given of a composition for heat transfer fluid according to the present disclosure.

[0011] (Composition for Heat Transfer Fluid)