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

SUMMARY

TECHNICAL PROBLEM

[0005] Although hexafluoropropene trimers have low GWP, they have high boiling points, and therefore it is difficult to use them at high temperatures.

[0006] The present disclosure aims at providing a heat transfer fluid suitable for use at relatively high temperatures.

SOLUTION TO PROBLEM

[0007] The present disclosure includes:

[1] A composition for heat transfer fluid, the composition comprising:
a hexafluoropropene trimer represented by C_9F_{18}; and
perfluorotripropylamine.

[2] The composition for heat transfer fluid according to [1] above, wherein the

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 [9] above or the heat transfer fluid according to any one of [10] to [12] above.

[18] The heat transfer method according to [17] 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:

a hexafluoropropene trimer represented by C_9F_{18}; and

perfluorotripropylamine.

[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 suitable for use at relatively high temperatures.

BRIEF DESCRIPTION OF DRAWINGS

[0009] [Fig. 1] Fig. 1 shows results of vapor-liquid equilibrium simulation of a mixture of the compound represented by the formula (I) and perfluorotripropylamine.

[Fig. 2] Fig. 2 shows results of vapor-liquid equilibrium simulation of a mixture of the compound represented by the formula (II) and perfluorotripropylamine.

[Fig. 3] Fig. 3 shows results of vapor-liquid equilibrium simulation of a mixture of the compound represented by the formula (III) and perfluorotripropylamine.

DESCRIPTION OF EMBODIMENTS

[0010] 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.

[0011] In the following, a description will be given of a composition for heat transfer fluid according to the present disclosure.

[0012] (Composition for Heat Transfer Fluid)

The composition for heat transfer fluid according to the present disclosure contains a hexafluoropropene trimer represented by C_9F_{18} and perfluorotripropylamine.

[0013] The hexafluoropropene trimer represented by C_9F_{18} has a low pour point and a low kinematic viscosity at low temperatures and therefore it is suitable for use at low temperatures; however, due to its low boiling point, it is difficult to use it at high