CLAIMS

[Claim 1]

A method for producing a fluoroalkyne compound represented by formula (1):

$R^1C{\equiv}CR^2$ (1)

wherein R^1 and R^2 are the same or different and each is a fluorine atom or a fluoroalkyl group,

the method comprising subjecting a fluoroalkane compound represented by formula (2):

$R^1CHX^1CFX^2R^2$ (2)

wherein R^1 and R^2 are as defined above; and X^1 is a fluorine atom and X^2 is a hydrogen atom, or X^1 is a hydrogen atom and X^2 is a fluorine atom, to a dehydrofluorination reaction in the presence of a solvent containing an ether, and a base comprising a hydroxide and/or alkoxide of an alkali metal and/or alkaline earth metal,

the method satisfying at least one requirement selected from the group consisting of the following:

(I) the fluoroalkyl group is a C_1-C_4 fluoroalkyl group, and

(II) the ether is a chain ether~~, and the dehydrofluorination reaction is performed in the presence of the solvent containing a chain ether, and a base comprising a hydroxide and/or alkoxide of an alkali metal and/or alkaline earth metal~~.

[Claim 2]

The production method according to claim 1, wherein the water concentration of the solvent containing an ether is 0.01 to 500 mass ppm based on the total amount of the solvent containing an ether taken as 100 mass%.

[Claim 3]

The production method according to claim 1 or 2, wherein the number of ether bonds in the ether is 1 to 10.

[Claim 4]

The production method according to any one of claims 1 to 3, which satisfies requirement (I).

[Claim 5]

The production method according to claim 4, wherein the fluoroalkyl group is represented by formula (3):

$-CF_2R^3$ (3)

wherein R^3 is a fluorine atom or a C_1-C_3 fluoroalkyl group.

~~[Claim 6]~~

~~The production method according to claim 4 or 5, wherein the dehydrofluorination reaction is performed in the presence of a base.~~

~~[Claim 7]~~

~~The production method according to claim 6, wherein the base is a hydroxide and/or alkoxide of an alkali metal and/or alkaline earth metal.~~

[Claim ~~8~~6]

The production method according to any one of claims 1 to 3, which satisfies requirement (II).

[Claim ~~9~~7]

The production method according to claim ~~8~~6, wherein the fluoroalkyl group has 1 to 10 carbon atoms.

[Claim ~~10~~8]

The production method according to claim ~~8~~6 or ~~9~~7, wherein the fluoroalkyl group is represented by formula (3):

$-CF_2R^3$ (3)

wherein R^3 represents a fluorine atom or a C_1-C_9 fluoroalkyl group.

[Claim ~~11~~9]

The production method according to any one of claims 1

to ~~10~~8, wherein the reaction temperature in the dehydrofluorination reaction is 0 to 300°C.

[Claim ~~12~~10]

A composition comprising a fluoroalkyne compound represented by formula (1):

$R^1C{\equiv}CR^2$ (1)

wherein R^1 and R^2 are the same or different and each is ~~a fluorine atom or~~ a C_1-C_4 fluoroalkyl group, and a fluoroalkene compound represented by formula (4):

$R^1CF{=}CHR^2$ (4)

wherein R^1 and R^2 are as defined above,

the content of the fluoroalkyne compound represented by formula (1) being 25.00 to 75.00 mol%, the content of the fluoroalkene compound represented by formula (4) being 25.00 to 75.00 mol%, and the total content of the fluoroalkyne compound represented by formula (1) and the fluoroalkene compound represented by formula (4) being 90.00 to 100.00 mol%, based on the total amount of the composition taken as 100 mol%.

[Claim ~~13~~11]

The composition according to claim ~~12~~10, which is for use as a cleaning gas, an etching gas, a refrigerant, a heat transfer medium, or a building block for organic synthesis.