CLAIMS

[Claim 1] A method for increasing the amount of a hydrocarbon oil, wherein water bubbled with air in the presence of an enzyme comprising a lipase or a zeolite or a zeolite-like substance comprising the enzyme and methanol are mixed; the obtained liquid mixture and a material hydrocarbon oil are mixed to prepare an emulsion; and the emulsion and a carbon dioxide-containing gas are brought into contact with each other,

wherein the carbon dioxide-containing gas contains a carbon dioxide recovered from a burnt gas.

[Claim 2] A production method for producing a hydrocarbon oil, wherein water bubbled with air in the presence of an enzyme comprising a lipase or a zeolite or a zeolite-like substance comprising the enzyme and methanol are mixed; the obtained liquid mixture and a material hydrocarbon oil are mixed to prepare an emulsion; the emulsion and a carbon dioxide-containing gas are subjected to a contact treatment; and a hydrocarbon oil is collected from the resulting treated product,

wherein the carbon dioxide-containing gas contains a carbon dioxide recovered from a burnt gas.

[Claim 3] The method according to claim 1 or 2, wherein the hydrocarbon oil is produced on the basis of the reactions represented by the following formulas (1) and (2):

$$CO_2 + H_2O + C_nH_{2n+2} = C_{n+1}H_{2n+4} + 3/2O_2 \quad (1)$$

$$CH_3OH + C_nH_{2n+2} = C_{n+1}H_{2n+4} + H_2O \quad (2)$$

[Claim 4] The method according to claim 1 or 2, wherein water comprises an active species.

[Claim 5] The method according to claim 1 or 2, wherein the hydrocarbon oil is any of light oil, heavy oil, heating oil, kerosene and gasoline.

[Claim 6] A production apparatus for producing a hydrocarbon oil comprising: a mixing tank for mixing water bubbled with air in the presence of an enzyme comprising a lipase or a zeolite or a zeolite-like substance comprising the enzyme and methanol; an emulsion preparation tank for preparing an emulsion by mixing the liquid mixture contained in the mixing tank and a hydrocarbon oil; and a contact tank for bringing the prepared emulsion and carbon dioxide into contact with each other,

wherein the carbon dioxide contains a carbon dioxide recovered from a burnt gas.

[Claim 7] The apparatus according to claim 7, wherein the carbon dioxide contains the carbon dioxide in the atmosphere.

[Claim 8] The apparatus according to claim 6 or 7, wherein the carbon dioxide is introduced into the emulsion preparation tank.