same as the ratio of the number of moles of the C18 to C22 fatty acid methyl ester relative to the total number of moles of the fatty acid methyl ester component.

For example, when the fatty acid methyl ester component is composed of fatty acid methyl esters represented by formula (2) shown above, and contains a C18 to C22 fatty acid methyl ester in which $R^1$ in formula (2) is a saturated or unsaturated hydrocarbon group of 17 to 21 carbon atoms as the main component, a fatty acid polyoxyethylene methyl ether is obtained that is composed of compounds represented by formula (4) shown below, and contains a compound in which $R^1$ in formula (4) is a saturated or unsaturated hydrocarbon group of 17 to 21 carbon atoms as the main component. When the fatty acid methyl ester component also contains a fatty acid methyl ester in which $R^1$ in formula (2) is a saturated or unsaturated hydrocarbon group of 9 to 16 carbon atoms, the obtained fatty acid polyoxyethylene methyl ether will also contain a compound in which $R^1$ in formula (4) is a saturated or unsaturated hydrocarbon group of 9 to 16 carbon atoms.

$$R^1CO(OE)_pOCH_3 \qquad (4)$$

In formula (4), $R^1$ is the same as defined above, E represents an ethylene group, and p is a positive integer.

$(OE)_p$ is formed by the addition of ethylene oxide. Further, p corresponds with the average number of added moles of ethylene oxide.

[0039]

In the fatty acid polyoxyethylene methyl ether, the average number of added moles of ethylene oxide per 1 mol of the fatty acid methyl ester is preferably within a range from 1 to 50, more preferably from 3 to 30, and even more preferably from 5 to 20.

[Table 3]

| | | Example 9 | Example 10 | Comparative Example 3 | Comparative Example 4 | Comparative Example 5 |
|---|---|---|---|---|---|---|
| Conditions | Fatty acid methyl ester component | C18 | C18 | C12 | C12 | C18 |
| | Alcohol | DEG | DEG | DEG | none | none |
| | Alcohol amount (%) | 0.125 | 0.125 | 0.125 | 0 | 0 |
| | Catalyst amount (%) | 0.3 | 0.05 | 0.1 | 0.1 | 0.1 |
| | Alkali amount (% relative to catalyst) | 3 | 3 | 3 | 3 | 3 |
| Evaluations | Narrow ratio (%) | 55 | 55 | 55 | 50 | 50 |
| | Induction period (h) | 0 | 0 | 2 | 0.5 | 0.5 |
| | Reaction time (h) | 3 | 8 | 4.5 | 6 | 6 |
| | Purification time (h) | 7 | 4.5 | 5 | 5 | 7 |

[0057]

Based on comparison of Example 1 and Comparative Examples 3 to 5, it is evident that when the fatty acid methyl ester component contained the C18 to C22 fatty acid methyl ester as the main component, the alcohol described above enabled the induction period to be eliminated, whereas when the fatty acid methyl ester component contained the C12 fatty acid methyl ester as the main component, the above alcohol actually lengthened the induction period.

Based on a comparison of Comparative Examples 1 and 5, it is evident that glycerol actually lengthened the induction period.

Based on a comparison of Examples 1 to 3 and 8 and Comparative Example 5, it is evident that the alcohol described above shortens the reaction time but lengthens the purification time.

Based on a comparison of Examples 1, 4, 5 and 7 and Comparative Examples 1, 2 and 5, it is evident that, compared with the case where glycerol is used, using the alcohol