storage) and high temperature high pressure/shear flow rate phase separation (in a working engine) of these emulsions present the major hurdle preventing their commercial use.

DE-A-3229918 teaches the preparation of emulsions of 25 wt. of water in diesel oil using emulsifier which are polyesters of saturated or unsaturated fatty acids having 8-22 carbon atoms. The emulsifiers include polyglycerol esters, sorbitan esters or diacetyltartaric acid esters of glycerol esters of the fatty acids. The emulsifiers are dosed in the fuel compositions in amounts of 0.65 to 1.6 wt.%. The diesel emulsions are taught to be stable for at least 6 months and, as compared with pure diesel oil used in engines, give a better fuel economy, less coke deposition and a lower content of CO and hydrocarbons in the exhaust gas. In such a system, the emulsifier is potentially the most expensive component and dosage at the high levels of this document, such as at 1.6 wt.% would be expensive in use and potentially not commercially viable.

The present invention addresses the problems associated with the use of fuel emulsion compositions by providing a stable fuel emulsion composition with the beneficial reduction in NOx emissions using commercially viable amounts of emulsifier.

The present invention alleviates the problems of the prior art.

In one aspect the present invention provides a fuel composition comprising:
(a) a fuel; and
(b) a polyglycerol ester of a fatty acid wherein the polyglycerol ester of a fatty acid is present in an amount no greater than 0.5 weight% based on the total fuel composition;
wherein ~~the~~ a polyglycerol composition used to form the polyglycerol ester of a fatty acid comprises a mixture of
diglycerol in an amount of 11.0 to 34.0 weight% based on the combined weight of the polyglycerols; triglycerol in an amount of 9.5 to 24.5 weight% based on the combined weight of the polyglycerols; tetraglycerol in an amount of 6.0 to 21.0 weight% based on the combined weight of the polyglycerols; pentaglycerol in an amount of 3.5 to 19.0 weight% based on the combined weight of the polyglycerols; hexaglycerol in an amount of 6.0 to 13.5 weight% based on the combined weight of the polyglycerols; heptaglycerol in an amount of 5.0 to 13.0 weight% based on the combined weight of the polyglycerols; octaglycerol in an amount of 3.0 to 12.0 weight% based on the combined weight of the

polyglycerols; nonaglycerol in an amount of 1.5 to 10.0 weight% based on the combined weight of the polyglycerols; decaglycerol in an amount of 0.0 to 8.0 weight% based on the combined weight of the polyglycerols; and unadecaglycerol in an amount of 0.0 to 7.0 weight% based on the combined weight of the polyglycerols.

In one aspect the present invention provides a method for improving the stability of a fuel composition containing (a) fuel, (b) a polyglycerol ester of a fatty acid, wherein the polyglycerol ester of a fatty acid is present in an amount no greater than 0.5 weight% based on the total fuel composition and (c) water, the method comprising mixing with the fuel and water~~, (b) a polyglycerol ester of a fatty acid~~;

wherein the polyglycerol composition used to form the polyglycerol ester of a fatty acid comprises a mixture of

diglycerol in an amount of 11.0 to 34.0 weight% based on the combined weight of the polyglycerols; triglycerol in an amount of 9.5 to 24.5 weight% based on the combined weight of the polyglycerols; tetraglycerol in an amount of 6.0 to 21.0 weight% based on the combined weight of the polyglycerols; pentaglycerol in an amount of 3.5 to 19.0 weight% based on the combined weight of the polyglycerols; hexaglycerol in an amount of 6.0 to 13.5 weight% based on the combined weight of the polyglycerols; heptaglycerol in an amount of 5.0 to 13.0 weight% based on the combined weight of the polyglycerols; octaglycerol in an amount of 3.0 to 12.0 weight% based on the combined weight of the polyglycerols; nonaglycerol in an amount of 1.5 to 10.0 weight% based on the combined weight of the polyglycerols; decaglycerol in an amount of 0.0 to 8.0 weight% based on the combined weight of the polyglycerols; and unadecaglycerol in an amount of 0.0 to 7.0 weight% based on the combined weight of the polyglycerols.

In one aspect the present invention provides a kit for preparing a fuel composition as defined herein, the kit comprising a polyglycerol ester of a fatty acid as described herein; together with instructions for use to prepare a fuel composition containing fuel and water.

In one aspect the present invention provides use of a polyglycerol ester of a fatty acid for improving the stability of a fuel composition containing fuel and water;

wherein the polyglycerol ester of a fatty acid is present in an amount no greater than 0.5 weight% based on the total fuel composition

and wherein the polyglycerol composition used to form the polyglycerol ester of a fatty acid comprises a mixture of

diglycerol in an amount of 11.0 to 34.0 weight% based on the combined weight of the polyglycerols; triglycerol in an amount of 9.5 to 24.5 weight% based on the combined weight of the polyglycerols; tetraglycerol in an amount of 6.0 to 21.0 weight% based on the combined weight of the polyglycerols; pentaglycerol in an amount of 3.5 to 19.0 weight% based on the combined weight of the polyglycerols; hexaglycerol in an amount of 6.0 to 13.5 weight% based on the combined weight of the polyglycerols; heptaglycerol in an amount of 5.0 to 13.0 weight% based on the combined weight of the polyglycerols; octaglycerol in an amount of 3.0 to 12.0 weight% based on the combined weight of the polyglycerols; nonaglycerol in an amount of 1.5 to 10.0 weight% based on the combined weight of the polyglycerols; decaglycerol in an amount of 0.0 to 8.0 weight% based on the combined weight of the polyglycerols; and unadecaglycerol in an amount of 0.0 to 7.0 weight% based on the combined weight of the polyglycerols.

We have shown that when a polyglycerol composition is used which has predominantly one polyglycerol present, such as diglycerol or triglycerol, then the polyglycerol composition must be present in a significantly higher amount to provide a fuel/water emulsion which is stable during storage. In contrast we have surprisingly found that having a broad range of polyglycerols present in a polyglycerol composition, and in particular the specific ranges recited herein, then a lower and therefore commercially viable amount of emulsifiers may be used while still providing a fuel and water emulsion which is stable over the period required in use, such as 3 hours. The "flat" distribution of polyglycerols allows for this enhanced effect at low dosages. By flat distribution it is meant that the polyglycerols contain a broad range of polyglycerols chain lengths and the broad range of polyglycerols are present in an amount such that only a few polyglycerol chain lengths dominate the distribution of polyglycerols. For example in a flat distribution one or two polyglycerol chain lengths do not make up 70 or 80% of the total amount of polyglycerols.

For ease of reference these and further aspects of the present invention are now discussed under appropriate section headings. However, the teachings under each section are not necessarily limited to each particular section.

Composition

As previously mentioned, in one aspect the present invention provides a fuel composition comprising:

(a) a fuel; and

(b) a polyglycerol ester of a fatty acid, wherein the polyglycerol ester of a fatty acid is present in an amount no greater than 0.5 weight% based on the total fuel composition;

wherein ~~the~~ a polyglycerol composition used to form the polyglycerol ester of a fatty acid comprises a mixture of

diglycerol in an amount of 11.0 to 34.0 weight% based on the combined weight of the polyglycerols; triglycerol in an amount of 9.5 to 24.5 weight% based on the combined weight of the polyglycerols; tetraglycerol in an amount of 6.0 to 21.0 weight% based on the combined weight of the polyglycerols; pentaglycerol in an amount of 3.5 to 19.0 weight% based on the combined weight of the polyglycerols; hexaglycerol in an amount of 6.0 to 13.5 weight% based on the combined weight of the polyglycerols; heptaglycerol in an amount of 5.0 to 13.0 weight% based on the combined weight of the polyglycerols; octaglycerol in an amount of 3.0 to 12.0 weight% based on the combined weight of the polyglycerols; nonaglycerol in an amount of 1.5 to 10.0 weight% based on the combined weight of the polyglycerols; decaglycerol in an amount of 0.0 to 8.0 weight% based on the combined weight of the polyglycerols; and unadecaglycerol in an amount of 0.0 to 7.0 weight% based on the combined weight of the polyglycerols.

Polyglycerol Ester of a Fatty Acid

As is understood by one skilled in the art polyglycerol ester of a fatty acid is an emulsifier comprising a polyglycerol 'backbone' onto which fatty acid side chains are attached.

Polyglycerol esters of fatty acids are typically prepared by polymerisation of glycerol to provide one or more polyglycerols to which the fatty acids are then attached. The fatty acids are generally attached by one of two routes. A first route involves the direct attachment of the fatty acid to the polyglycerol. The second route involves inter-esterifying a polyglycerol and a triglyceride thereby transferring fatty acids from the triglyceride to the polyglycerol. The polymerisation of glycerol typically provides a mixture of polyglycerols of different degrees of polymerisation. The mixture of polyglycerols of different degrees of polymerisation is described herein as a polyglycerol composition. It

will be understood by one skilled in the art that references to a polyglycerol composition having particular polyglycerol components requires only that those components be present in the amount specified. It will be appreciated by one skilled in the art that because of the nature of polymerisation of glycerol, the polyglycerol composition may contain other polyglycerols having degrees of polymerisation not recited herein. In determining the amounts of polyglycerols in the polyglycerol composition, the total amount of all polyglycerols (irrespective of degree of polymerisation) is determined to provide the total weight of the polyglycerol composition. Materials which are not a polyglycerol do not form part of the polyglycerol composition and their weight is not considered when determining the total weight of the polyglycerol composition.

References in the present specification to "the combined weight of the polyglycerols" encompass the total combined weight of all polyglycerols, irrespective of their chain length and irrespective of whether the polyglycerol is recited in the listing of polyglycerols, and include the weight of the polyglycerol composition.

As discussed here in the polyglycerol composition used to form the polyglycerol ester of a fatty acid comprises a mixture of diglycerol in an amount of 11.0 to 34.0 weight% based on the combined weight of the polyglycerols; triglycerol in an amount of 9.5 to 24.5 weight% based on the combined weight of the polyglycerols; tetraglycerol in an amount of 6.0 to 21.0 weight% based on the combined weight of the polyglycerols; pentaglycerol in an amount of 3.5 to 19.0 weight% based on the combined weight of the polyglycerols; hexaglycerol in an amount of 6.0 to 13.5 weight% based on the combined weight of the polyglycerols; heptaglycerol in an amount of 5.0 to 13.0 weight% based on the combined weight of the polyglycerols; octaglycerol in an amount of 3.0 to 12.0 weight% based on the combined weight of the polyglycerols; nonaglycerol in an amount of 1.5 to 10.0 weight% based on the combined weight of the polyglycerols; decaglycerol in an amount of 0.0 to 8.0 weight% based on the combined weight of the polyglycerols; and unadecaglycerol in an amount of 0.0 to 7.0 weight% based on the combined weight of the polyglycerols.

It will be appreciated by one skilled in the art that polyglycerols may be either in the form of a cyclic polyglycerol or an acyclic polyglycerol. Acyclic polyglycerols are straight chain and branched chain polyglycerols, that is acyclic polyglycerols are formed entirely from glycerol groups linked such that no rings are formed. Cyclic polyglycerols contain a ring

structure. References in the present specification to a polyglycerol of a particular degree of polymerisation, for example triglycerol referring to a polyglycerol having a degree of polymerisation of 3, include both the polyglycerol in cyclic form and in acyclic form. We have further determined the preferred amounts of cyclic and acyclic polyglycerols for each of diglycerol, triglycerol, tetraglycerol and pentaglycerol. In one preferred aspect the diglycerol comprises acyclic diglycerol in an amount of 6.0 to 25.0 weight% based on the combined weight of the polyglycerols, and cyclic diglycerol in an amount of 5.0 to 13.0 weight% based on the combined weight of the polyglycerols. In one preferred aspect the

The degree of water droplet sedimentation in the emulsions expressed as the amount of free oil on top formed during 3 hours of storage at 55°C is shown in Figure 13.

~~All publications mentioned in the above specification are herein incorporated by reference. Various modifications and variations of the described methods and system of the invention will be apparent to those skilled in the art without departing from the scope and spirit of the invention. Although the invention has been described in connection with specific preferred embodiments, it should be understood that the invention as claimed should not be unduly limited to such specific embodiments. Indeed, various modifications of the described modes for carrying out the invention which are obvious to those skilled in chemistry or related fields are intended to be within the scope of the following claims~~

CLAIMS

1. A fuel composition comprising:

(a) a fuel; and

(b) a polyglycerol ester of a fatty acid, wherein the polyglycerol ester of a fatty acid is present in an amount no greater than 0.5 weight% based on the total fuel composition; wherein ~~the~~ a polyglycerol composition used to form the polyglycerol ester of a fatty acid comprises a mixture of

diglycerol in an amount of 11.0 to 34.0 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition;

triglycerol in an amount of 9.5 to 24.5 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition;

tetraglycerol in an amount of 6.0 to 21.0 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition;

pentaglycerol in an amount of 3.5 to 19.0 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition;

hexaglycerol in an amount of 6.0 to 13.5 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition;

heptaglycerol in an amount of 5.0 to 13.0 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition;

octaglycerol in an amount of 3.0 to 12.0 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition;

nonaglycerol in an amount of 1.5 to 10.0 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition;

decaglycerol in an amount of 0.0 to 8.0 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition; and

unadecaglycerol in an amount of 0.0 to 7.0 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition.

2. ~~A~~The fuel composition according to claim 1, wherein the polyglycerol composition used to form the polyglycerol ester of a fatty acid comprises a mixture of

diglycerol in an amount of 11.0 to 28.0 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition;

triglycerol in an amount of 9.5 to 24.5 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition;

tetraglycerol in an amount of 6.0 to 21.0 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition;

pentaglycerol in an amount of 3.5 to 19.0 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition;

hexaglycerol in an amount of 6.0 to 13.5 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition;

heptaglycerol in an amount of 5.0 to 13.0 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition;

octaglycerol in an amount of 4.0 to 12.0 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition;

nonaglycerol in an amount of 2.0 to 10.0 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition;

decaglycerol in an amount of 0.5 to 8.0 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition; and

unadecaglycerol in an amount of 0.1 to 7.0 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition.

3. ~~A~~ The fuel composition according to claim 1, wherein

the diglycerol comprises acyclic diglycerol in an amount of 6.0 to 25.0 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition, and cyclic diglycerol in an amount of 5.0 to 13.0 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition

the triglycerol comprises acyclic triglycerol in an amount of 7.0 to 21.0 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition, and cyclic triglycerol in an amount of 2.5 to 9.5 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition;

the tetraglycerol comprises acyclic tetraglycerol in an amount of 5.5 to 15.0 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition, and cyclic tetraglycerol in an amount of 0.5 to 8.0 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition; and

the pentaglycerol comprises acyclic pentaglycerol in an amount of 3.0 to 11.0 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition, and cyclic pentaglycerol in an amount of 0.5 to 8.0 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition.

4. ~~A~~The fuel composition according to claim 2, wherein

the diglycerol comprises acyclic diglycerol in an amount of 6.0 to 15.0 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition, and cyclic diglycerol in an amount of 5.0 to 13.0 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition

the triglycerol comprises acyclic triglycerol in an amount of 7.0 to 15.0 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition, and cyclic triglycerol in an amount of 2.5 to 9.5 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition;

the tetraglycerol comprises acyclic tetraglycerol in an amount of 5.0 to 13.0 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition, and cyclic tetraglycerol in an amount of 1.0 to 8.0 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition; and

the pentaglycerol comprises acyclic pentaglycerol in an amount of 3.0 to 11.0 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition, and cyclic pentaglycerol in an amount of 0.5 to 8.0 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition.

5. The~~A~~ fuel composition according to any one of the preceding claims, wherein the polyglycerol composition used to form the polyglycerol ester of a fatty acid comprises a mixture of

the polyglycerol composition used to form the polyglycerol ester of a fatty acid comprises diglycerol in an amount of 15.0 to 23.5 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition;

the polyglycerol composition used to form the polyglycerol ester of a fatty acid comprises triglycerol in an amount of 13.5 to 20.5 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition;

the polyglycerol composition used to form the polyglycerol ester of a fatty acid comprises tetraglycerol in an amount of 10.0 to 17.0 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition;

the polyglycerol composition used to form the polyglycerol ester of a fatty acid comprises pentaglycerol in an amount of 8.0 to 14.5 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition;

the polyglycerol composition used to form the polyglycerol ester of a fatty acid comprises hexaglycerol in an amount of 8.0 to 11.5 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition;

the polyglycerol composition used to form the polyglycerol ester of a fatty acid comprises heptaglycerol in an amount of 7.5 to 11.0 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition;

the polyglycerol composition used to form the polyglycerol ester of a fatty acid comprises octaglycerol in an amount of 6.5 to 10.0 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition;

the polyglycerol composition used to form the polyglycerol ester of a fatty acid comprises nonaglycerol in an amount of 4.0 to 8.0 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition;

the polyglycerol composition used to form the polyglycerol ester of a fatty acid comprises decaglycerol in an amount of 1.5 to 6.0 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition; and

the polyglycerol composition used to form the polyglycerol ester of a fatty acid comprises unadecaglycerol in an amount of 0.5 to 5.0 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition.

6. The~~A~~ fuel composition according to claim 5, wherein

the diglycerol comprises acyclic diglycerol in an amount of 8.0 to 12.5 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition, and cyclic diglycerol in an amount of 7.5 to 11.0 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition;

the triglycerol comprises acyclic triglycerol in an amount of 9.0 to 13.0 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition, and cyclic triglycerol in an amount of 4.5 to 7.5 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition;

the tetraglycerol comprises acyclic tetraglycerol in an amount of 7.5 to 11.0 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition, and cyclic tetraglycerol in an amount of 2.5 to 6.0 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition; and

the pentaglycerol comprises acyclic pentaglycerol in an amount of 5.0 to 9.0 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol

composition, and cyclic pentaglycerol in an amount of 2.5 to 6.0 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition.

7. The~~A~~ fuel composition according to any one of the preceding claims, wherein the polyglycerol composition used to form the polyglycerol ester of a fatty acid comprises a mixture of

the polyglycerol composition used to form the polyglycerol ester of a fatty acid comprises diglycerol in an amount of 17.6 to 21.0 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition;

the polyglycerol composition used to form the polyglycerol ester of a fatty acid comprises triglycerol in an amount of 15.9 to 18.1 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition;

the polyglycerol composition used to form the polyglycerol ester of a fatty acid comprises tetraglycerol in an amount of 12.5 to 14.0 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition;

the polyglycerol composition used to form the polyglycerol ester of a fatty acid comprises pentaglycerol in an amount of 10.5 to 12.2 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition;

the polyglycerol composition used to form the polyglycerol ester of a fatty acid comprises hexaglycerol in an amount of 9.3 to 10.1 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition;

the polyglycerol composition used to form the polyglycerol ester of a fatty acid comprises heptaglycerol in an amount of 8.6 to 9.9 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition;

the polyglycerol composition used to form the polyglycerol ester of a fatty acid comprises octaglycerol in an amount of 7.3 to 8.9 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition;

the polyglycerol composition used to form the polyglycerol ester of a fatty acid comprises nonaglycerol in an amount of 5.5 to 6.4 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition;

the polyglycerol composition used to form the polyglycerol ester of a fatty acid comprises decaglycerol in an amount of 2.9 to 4.5 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition; and

the polyglycerol composition used to form the polyglycerol ester of a fatty acid comprises unadecaglycerol in an amount of 1.8 to 3.7 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition.

8. The~~A~~ fuel composition according to claim 7, wherein

the diglycerol comprises acyclic diglycerol in an amount of 9.1 to 11.4 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition, and cyclic diglycerol in an amount of 8.5 to 9.5 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition;

the triglycerol comprises acyclic triglycerol in an amount of 10.0 to 11.8 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition, and cyclic triglycerol in an amount of 5.9 to 6.3 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition;

the tetraglycerol comprises acyclic tetraglycerol in an amount of 8.4 to 9.5 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition, and cyclic tetraglycerol in an amount of 4.1 to 4.4 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition; and

the pentaglycerol comprises acyclic pentaglycerol in an amount of 6.7 to 7.6 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition, and cyclic pentaglycerol in an amount of 3.8 to 4.6 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition.

9. The~~A~~ fuel composition according to claim 1, wherein in the polyglycerol composition used to form the polyglycerol ester of a fatty acid

the diglycerol comprises acyclic diglycerol in an amount of 9.0 to 24.5 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition, and cyclic diglycerol in an amount of 6.5 to 10.0 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition;

the triglycerol comprises acyclic triglycerol in an amount of 9.0 to 20.5 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition, and cyclic triglycerol in an amount of 3.5 to 6.5 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition;

the tetraglycerol comprises acyclic tetraglycerol in an amount of 8.0 to 13.5 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol

composition, and cyclic tetraglycerol in an amount of 2.0 to 4.5 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition; and

the pentaglycerol comprises acyclic pentaglycerol in an amount of 6.0 to 9.0 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition, and cyclic pentaglycerol in an amount of 2.0 to 5.0 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition.

10. The~~A~~ fuel composition according to claim 7, wherein in the polyglycerol composition used to form the polyglycerol ester of a fatty acid

the diglycerol comprises acyclic diglycerol in an amount of 20.0 to 26.0 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition, and cyclic diglycerol in an amount of 6.5 to 8.0 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition;

the triglycerol comprises acyclic triglycerol in an amount of 18.0 to 21.0 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition, and cyclic triglycerol in an amount of 2.5 to 5.0 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition;

the tetraglycerol comprises acyclic tetraglycerol in an amount of 11.0 to 14.5 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition, and cyclic tetraglycerol in an amount of 1.5 to 4.0 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition; and

the pentaglycerol comprises acyclic pentaglycerol in an amount of 6.5 to 9.5 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition, and cyclic pentaglycerol in an amount of 1.5 to 4.0 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition.

11. The~~A~~ fuel composition according to any one of the preceding claims, wherein the polyglycerol composition used to form the polyglycerol ester of a fatty acid has a hydroxyl value of from 880 to 1230 mg KOH/g.

12. The~~A~~ fuel composition according to claims 11, wherein the polyglycerol composition used to form the polyglycerol ester of a fatty acid has a hydroxyl value of from 1130 to 1230 mg KOH/g.

13. TheA fuel composition according to claim 11, wherein the polyglycerol composition used to form the polyglycerol ester of a fatty acid has a hydroxyl value of from 880 to 1060 mg KOH/g.

14. TheA fuel composition according to claim 11, wherein the polyglycerol composition used to form the polyglycerol ester of a fatty acid has a hydroxyl value of from 950 to 990 mg KOH/g.

15. TheA fuel composition according to any one of the preceding claims, wherein the polyglycerol composition used to form the polyglycerol ester of a fatty acid has a refractive index at 25°C of from 1.4855 to 1.4935.

16. TheA fuel composition according to any one of the preceding claims, wherein the polyglycerol composition used to form the polyglycerol ester of a fatty acid has a refractive index at 50°C of from 1.4895 to 1.4925.

17. TheA fuel composition according to any one of the preceding claims, wherein the polyglycerol composition used to form the polyglycerol ester of a fatty acid has a refractive index at 50°C of from 1.4900 to 1.4920.

~~18. A fuel composition according to any one of the preceding claims wherein the polyglycerol ester of a fatty acid has a viscosity of less than 700 mPa s at 20°C~~

~~19. A fuel composition according to any one of the preceding claims wherein the polyglycerol ester of a fatty acid has a viscosity of less than 200 mPa s at 20°C~~

~~20~~18. TheA fuel composition according to any one of the preceding claims, wherein the polyglycerol ester of a fatty acid is prepared by reacting a polyglycerol and a fatty acid triglyceride in a ratio of polyglycerol to fatty acid triglyceride of from 1:1 to 1:8.

~~21. A fuel composition according to any one of the preceding claims wherein the (b) a polyglycerol ester of a fatty acid is present in an amount of no greater than 0.5wt% based on the total fuel composition.~~

~~22~~19. The~~A~~ fuel composition according to any one of the preceding claims, wherein the (b) a polyglycerol ester of a fatty acid is present in an amount of no greater than 0.25 weight~~wt~~% based on the total fuel composition.

~~23~~20. The~~A~~ fuel composition according to any one of the preceding claims, wherein the (b) a polyglycerol ester of a fatty acid is present in an amount of no greater than 0.2 weight~~wt~~% based on the total fuel composition.

~~24~~21. The~~A~~ fuel composition according to any one of the preceding claims, wherein the (b) a polyglycerol ester of a fatty acid is present in an amount of no greater than 0.1 weight~~wt~~% based on the total fuel composition.

~~25~~22. The~~A~~ fuel composition according to any one of the preceding claims, wherein the fuel is selected from diesel, heavy fuel oil, marine gasoil and kerosene.

~~26~~23. The~~A~~ fuel composition according to claim ~~25~~ 22, wherein the fuel is marine gasoil.

~~27~~24. The~~A~~ fuel composition according to any one of the preceding claims, wherein the fuel composition further comprises (c) water.

~~28~~25. The~~A~~ fuel composition according to claim ~~27~~24, wherein the fuel composition further comprises (c) water in an amount of from 10 to 70 weight ~~wt.~~% based on the total fuel composition.

~~29~~26. The~~A~~ fuel composition according to claim ~~27~~24, wherein the fuel composition further comprises (c) water in an amount of from 30 to 60 weight ~~wt.~~% based on the total fuel composition.

~~30~~27. The~~A~~ fuel composition according to claim ~~27~~24, wherein the fuel composition further comprises (c) water in an amount of from 33 to 50 weight ~~wt.~~% based on the total fuel composition.

~~31~~28. A method for improving the stability of a fuel composition containing (a) fuel, (b) a polyglycerol ester of a fatty acid, wherein the polygycerol ester of a fatty acid is present

in an amount of no greater than 0.5 weight% based on the total fuel composition and (c) water, the method comprising mixing with the fuel and water,

~~(b) a polyglycerol ester of a fatty acid;~~

wherein the polyglycerol composition used to form the polyglycerol ester of a fatty acid comprises a mixture of

diglycerol in an amount of 11.0 to 34.0 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition;

triglycerol in an amount of 9.5 to 24.5 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition;

tetraglycerol in an amount of 6.0 to 21.0 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition;

pentaglycerol in an amount of 3.5 to 19.0 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition;

hexaglycerol in an amount of 6.0 to 13.5 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition;

heptaglycerol in an amount of 5.0 to 13.0 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition;

octaglycerol in an amount of 3.0 to 12.0 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition;

nonaglycerol in an amount of 1.5 to 10.0 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition;

decaglycerol in an amount of 0.0 to 8.0 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition; and

unadecaglycerol in an amount of 0.0 to 7.0 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition.

~~32~~29. ~~A~~The method according to claim ~~31~~28, ~~characterised by~~wherein the fuel composition is according to ~~the features of~~ any one of claims 2 to ~~30~~27.

~~33~~30. Use of a polyglycerol ester of a fatty acid for improving the stability of a fuel composition containing fuel and water;

wherein the polyglycerol ester of a fatty acid is present in an amount no greater than 0.5 weight% based on the total fuel composition;

and wherein the polyglycerol composition used to form the polyglycerol ester of a fatty acid comprises a mixture of

diglycerol in an amount of 11.0 to 34.0 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition;

triglycerol in an amount of 9.5 to 24.5 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition;

tetraglycerol in an amount of 6.0 to 21.0 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition;

pentaglycerol in an amount of 3.5 to 19.0 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition;

hexaglycerol in an amount of 6.0 to 13.5 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition;

heptaglycerol in an amount of 5.0 to 13.0 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition;

octaglycerol in an amount of 3.0 to 12.0 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition;

nonaglycerol in an amount of 1.5 to 10.0 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition;

decaglycerol in an amount of 0.0 to 8.0 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition; and

unadecaglycerol in an amount of 0.0 to 7.0 weight% based on the ~~combined weight of the polyglycerols~~weight of the polyglycerol composition.

~~34. A kit for preparing a fuel composition as defined in any one of claims 1 to 30, the kit comprising~~

~~a polyglycerol ester of a fatty acid; wherein the polyglycerol composition used to form the polyglycerol ester of a fatty acid comprises a mixture of~~

~~diglycerol in an amount of 11.0 to 34.0 weight% based on the combined weight of the polyglycerols;~~

~~triglycerol in an amount of 9.5 to 24.5 weight% based on the combined weight of the polyglycerols;~~

~~tetraglycerol in an amount of 6.0 to 21.0 weight% based on the combined weight of the polyglycerols;~~

~~pentaglycerol in an amount of 3.5 to 19.0 weight% based on the combined weight of the polyglycerols;~~

~~hexaglycerol in an amount of 6.0 to 13.5 weight% based on the combined weight of the polyglycerols;~~

~~heptaglycerol in an amount of 5.0 to 13.0 weight% based on the combined weight of the polyglycerols;~~

~~octaglycerol in an amount of 3.0 to 12.0 weight% based on the combined weight of the polyglycerols;~~

~~nonaglycerol in an amount of 1.5 to 10.0 weight% based on the combined weight of the polyglycerols;~~

~~decaglycerol in an amount of 0.0 to 8.0 weight% based on the combined weight of the polyglycerols; and~~

~~unadecaglycerol in an amount of 0.0 to 7.0 weight% based on the combined weight of the polyglycerols.~~

~~together with instructions for use to prepare the fuel composition.~~

~~35. A fuel composition substantially as hereinbefore described with reference to any one of the Examples.~~

~~36. A method substantially as hereinbefore described with reference to any one of the Examples.~~

~~37. A use substantially as hereinbefore described with reference to any one of the Examples.~~

~~38. A kit substantially as hereinbefore described with reference to any one of the Examples.~~