molecular weight of 1000 and a dicarboxylic acid. However, the inventors have surprisingly found that certain esters of polycarboxylic acids and polyhydric alcohols are particularly effective as detergents, especially in modern diesel engines having a high pressure fuel system.

SUMMARY

In one aspect, there is provided a diesel fuel composition comprising as an additive an ester compound which is the reaction product of an optionally substituted polycarboxylic acid or an anhydride thereof and a polyhydric alcohol of formula H-$(OR)_n$-OH, wherein R is an optionally substituted alkylene group and n is at least 1.

In another aspect, there is provided a method of combatting deposits in a diesel engine, the method comprising combusting in the engine a diesel fuel composition comprising as an additive the reaction product of an optionally substituted polycarboxylic acid or an anhydride thereof and a polyhydric alcohol of formula H-$(OR)_n$-OH, wherein R is an optionally substituted alkylene group and n is at least 1.

In yet another aspect, there is provided a use of an ester compound as a detergent additive in a diesel fuel composition in a diesel engine; wherein the ester compound is the reaction product of an optionally substituted polycarboxylic acid or an anhydride thereof and a polyhydric alcohol of formula H-$(OR)_n$-OH, wherein R is an optionally substituted alkylene group and n is at least 1.

In a further aspect of the present disclosure, there is provided a use of an ester additive as defined herein to reduce the treat rate of one or more further additives selected from lubricity improvers, corrosion inhibitors and cold flow improvers whilst maintaining performance.

DETAILED DESCRIPTION

According to a first aspect of the present invention there is provided a diesel fuel composition comprising as an additive an ester compound which is the reaction product of an optionally substituted polycarboxylic acid or an anhydride thereof and a polyhydric alcohol of formula H-$(OR)_n$-OH, wherein R is an optionally substituted alkylene group and n is at least 1.

According to a second aspect of the present invention there is provided a method of combatting deposits in a diesel engine, the method comprising combusting in the engine a

diesel fuel composition comprising as an additive an ester compound which is the reaction product of an optionally substituted polycarboxylic acid or an anhydride thereof and a polyhydric alcohol of formula H-$(OR)_n$-OH, wherein R is an optionally substituted alkylene group and n is at least 1.

According to a third aspect of the present invention there is provided the use of an ester compound as a detergent additive in a diesel fuel composition in a diesel engine; wherein the ester compound is the reaction product of an optionally substituted polycarboxylic acid or an anhydride thereof and a polyhydric alcohol of formula H-$(OR)_n$-OH, wherein R is an optionally substituted alkylene group and n is at least 1.

The method of the second aspect preferably involves combusting in the engine a composition of the first aspect.

Preferred features of the first, second and third aspects of the invention will now be described. Any feature of any aspect may be combined with any feature of any other aspect as appropriate.

The present invention relates to a composition, a method and a use involving a fuel additive. This additive is the reaction product of an optionally substituted polycarboxylic acid or an anhydride thereof and a polyhydric alcohol of formula H-$(OR)_n$-OH. The additive may be referred to herein as “the additive of the present invention” or as “the ester additive”.

Compounds of this type are known in the art and are described, for example in US2993773. However, they have not previously been used as detergents in diesel fuels.