

QUATERNARY AMMONIUM FUEL ADDITIVES

[ABSTRACT]

The present disclosure provides fuel additives including a quaternary ammonium salt formed by reacting an alkyl carboxylate with a compound formed from a hydrocarbyl substituted acylating agent reacted with a select amine. Also provided herein are fuel compositions including the novel fuel additives and methods of combusting a fuel including the fuel additives herein. The unique quaternary ammonium salts herein are advantageous because they can be made through a simple alkylation process and provide improved detergency at low treat rates by making available a relatively less sterically hindered quaternary nitrogen for detergency activity in the fuel.

[NO DRAWING]