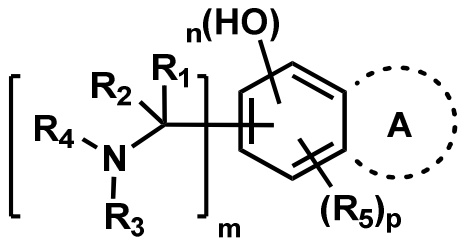
COMPOSITIONS FOR MITIGATING LOW SPEED PRE-IGNITION EVENTS

ABSTRACT

Fuel composition for preventing or reducing low speed pre-ignition events in a spark-ignited internal combustion engine is provided. The fuel composition includes a hydrocarbon fuel boiling the gasoline or diesel range and a primary additive having a structure given by



or a salt thereof. A is a ring moiety; R_1 and R_2 are independently H, C_1-C_{20} hydrocarbyl group, carboxyl group, ether, or hydroxyl group. R_3 and R_4 are independently H, C_1-C_{20} hydrocarbyl group, carboxyl group, ether, amino, or hydroxyl group or wherein R_3 and R_4 are part of a cyclic group. R_5 is C_1-C_{100} hydrocarbyl group, carboxyl group, ether, or hydroxyl group; and p is 0 to 2, n is 1 to 3, m is 1 to 3, and p+n+m is less than 5.

No figure