

Amine mixture

Abstract

- 5 An amine mixture comprising
- (A) a polyisobuteneamine $\text{PIB}(\text{CH}_2)_x(\text{OH})_m(\text{NR}^2\text{R}^3)_n$ where PIB is a structure derived from polybutene or polyisobutene, or a polybutyl or polyisobutyl radical, R^2 and R^3 are each hydrogen, aliphatic or aromatic hydrocarbyl radicals, primary or secondary, aromatic or aliphatic aminoalkylene radicals or polyaminoalkylene radicals, polyoxyalkylene radicals, heteroaryl or heterocyclyl radicals, and $x = 0$ or 1, $m = 0$ or 1 and $n = 1, 2$ or 3, and
- 10
- 15 (B) an aliphatic amine $\text{R}^4\text{-NR}^2\text{R}^3$ where R^4 is a $\text{C}_6\text{-}$ to $\text{C}_{600}\text{-alkyl}$ radical, obtainable by reductive amination of a mixture
- (i) of the oxo process product formed in the hydroformylation of polybutene or polyisobutene and of an alkanol $\text{R}^4\text{-OH}$ or
- 20
- (ii) of the epoxide formed in the epoxidation of polybutene or polyisobutene, and of an alkanol $\text{R}^4\text{-OH}$ or
- 25
- (iii) of the nitro compound which is formed in the reaction of polybutene or polyisobutene with nitrogen oxides, and of an alkanol $\text{R}^4\text{-OH}$
- with ammonia or an amine HNR^2R^3 .
- 30 This amine mixture is suitable for cleaning and keeping clean intake valves and injection nozzles in gasoline engines.