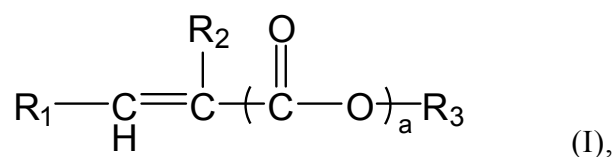


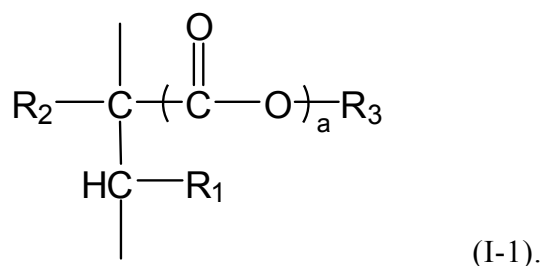
Abstract

The present disclosure relates to a gradient copolymer, its production, and application thereof. The gradient copolymer comprises or consists of n polymer components. The n polymer components each independently represents an addition polymer of a monomer of the formula (I),



and/or a mixture thereof, or

the n polymer components each independently comprises or consists essential of one or more structural units represented by the formula (I-1),



The symbol n represents an integer within the closed interval [5, ∞]. Where the average side chain carbon number of the i-th polymer component as determined according to the nuclear magnetic resonance method is expressed as X_i, with the symbol i representing an arbitrary integer from 1 to n, the relationship X₁<X₂<...<X_{n-1}<X_n holds. The gradient copolymer exhibits an excellent pour point depressing effect for lubricating oils and a broad adaptability to lubricating base oils when used as a pour point depressant. In the formula (I) or formula (I-1), the definition of each group and numerical value is the same as in the specification.

No suitable figure