

ABSTRACT

Copolymers when used as lubricating oil viscosity modifiers enable lubricating oils to show excellent
5 low-temperature properties. Processes for producing the copolymers are disclosed. Lubricating oil viscosity modifiers and lubricating oil compositions contain the copolymers.

A copolymer includes structural units derived from ethylene and structural units derived from a C3-20 α -olefin and
10 satisfies the following requirements (1) to (8): (1) the melting point (T_m) according to DSC is in the range of 0 to 60°C; (2) the melting point (T_m) and the density D (g/cm³) satisfy the equation: $T_m \geq 1073 \times D - 893$; (3) M_w/M_n according to GPC is from 1.6 to 5.0; (4) the half-value width (ΔT_{half}) of a melting
15 peak measured by DSC is not more than 90°C; (5) the half-value width (ΔT_{half}) and the melting point (T_m) satisfy the equation: $\Delta T_{half} \leq -0.71 \times T_m + 101.4$; (6) the heat of fusion (ΔH) as measured by DSC is not more than 60 J/g; (7) the crystallization temperature (T_c) measured by DSC is not more than 70°C; (8) the
20 heat of fusion (ΔH), the crystallization temperature (T_c), each measured by DSC and the crystallization temperature measured by a CRYSTAF method ($T_{crystaf}$) satisfy the equation: $T_c - T_{crystaf} \geq 0.028 \times \Delta H + 25.3$.