

that they emit low visible exhaust smoke and result in low carbon deposit formation in the engine exhaust system. GB-A-1287579 (The British Petroleum Co Ltd) applied for in 1963 describes, for instance, the use of polyisobutylene polymer as a lubricant.

- 5 However, typically, this specification does not give any method of manufacture of the poly(iso)butene nor indeed the source of C4 feedstock used as raw-material to produce these polyisobutylenes. It is well known that poly(iso)butenes used hitherto have invariably been produced from a mixture of butenes including n-butenes and
- 10 isobutene eg from a feedstock which is primarily butadiene raffinate or a crude C4 stream from a fluid catalytic cracking (FCC) process and contains from 20-40% n-butenes. That was the case around the time of application of GB-A-1287579 as is apparent from GB-A-1340804 (Labofina SA, applied for in 1972) which describes the polymers as
- 15 being manufactured from fractions containing hydrocarbons with 4 carbon atoms and the polymers produced therefrom are said to contain polybutylene and polyisobutylene in varying proportions, generally from 5-70% of polyisobutylene and from 95-30% of poly-n-butylenes.

- It has now been found that polybutenes which contain much
- 20 lower levels of or are substantially free from n-butenes in the polymer backbone give superior performance not only in reducing visible smoke in the exhaust gases from a two-stroke engines but also in respect of low carbon deposit formation.

Accordingly, the present invention is a two-stroke engine oil comprising a mineral oil and a polybutene polymer or mixtures of polymers of molecular weight (Mn) from 300-2000 characterised in that the proportion of n-butenes in the polymer backbone, as defined by the ratio of the infra-red absorbance of the $-\text{CH}_2\text{CH}_2-$ n-butene units in the polymer at 740 cm^{-1} to that of the C-H overtone absorbance between 4315 and 4345 cm^{-1} , usually 4335 cm^{-1} is <0.2 for polybutenes with a value of Mn which is equal to or <700 , and <0.12 for polybutenes with $\text{Mn} = >700$.

- The definition for the proportion of n-butene (hereafter "NB") in the polymer backbone has been defined by the infra-red absorbance
- 35 technique because this is a difficult concept to determine