

5 **IMPROVED NOBLE METAL ZEOLITE CATALYST FOR SECOND-STAGE
HYDROCRACKING TO MAKE MIDDLE DISTILLATE**

ABSTRACT

10 A second-stage hydrocracking catalyst is provided, comprising: a) a zeolite beta having
an OD acidity of 20 to 400 $\mu\text{mol/g}$ and an average domain size from 800 to 1500 nm²; b) a
zeolite USY having an ASDI between 0.05 and 0.12; c) a catalyst support; and d) 0.1 to 10 wt%
noble metal; wherein the second-stage hydrocracking catalyst provides a hydrogen consumption
less than 350 SCFB across a range of synthetic conversions up to 37 wt% when used to
15 hydrocrack hydrocarbonaceous feeds having an initial boiling point greater than 380 °F (193
°C). A second-stage hydrocracking process using the second-stage hydrocracking process is
provided. A method to make the second-stage hydrocracking catalyst is also provided.

Fig. 1