SUPPORTING INFORMATION

Effectiveness of Different Transition Metal Dispersed Catalysts for In-Situ Heavy Oil Upgrading

Abdullah Al-Marshed[a], Abarasi Hart[a], Gary Leeke[a], Malcolm Greaves[b] and Joseph Wood[a]*

[a]School of Chemical Engineering, University of Birmingham, Edgbaston, Birmingham, B15 2TT, UK

[b]IOR Research Group, Department of Chemical Engineering, University of Bath, BA2 7AY, UK

E-mail: J.Wood@bham.ac.uk

Table S1. Properties of THAI feedstock.

Properties	Results	Units
Density @ 25 °C	0.9776	(g/cm^3)
API° gravity @ 15 °C	12.8	(°)
Dynamic viscosity @ 20 °C	1482	(cP)
Asphaltene Content	14	(wt %)
Elemental analysis		
C	84.72	(wt %)
H	10.77	(wt %)
N	0.08	(wt %)
S	3.09	(wt %)
Ni	0.003	(wt %)
V	0.0102	(wt %)
(Ni + V)	0.0132	(wt %)
Simulate Distillation ASTM D2887		
Light naphtha (Initial Boiling Point, IBP-177°C)	0.68	(wt %)
Middle distillate (177°C–343 °C)	28.18	(wt %)
Gas oil (343 °C–525 °C)	71.6	(wt %)

Table S2. Experimental conditions.

Factor	Selected conditions
Reaction Temperature (°C)	425
Initial H_2 pressure (bar)	50
Reaction Time (min)	60
Metal loading (wt %)	0.1
Speed of mixing (rpm)	900

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The properties of the heavy feed oil and the experimental conditions.