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APPENDIX

Hydrogen Chemisorption of NiMo Catalysts

The reduced catalysts were characterized to determine the dispersion NiMo on the surface of catalysts. The results were shown in Table A.1. NiMo catalyst catalysts had low % dispersion which could be inferred to the lower amount of metal loading.

Table A.1 The amount of hydrogen uptake and percent metal dispersion of NiMo catalysts

Catalyst	H_2 Uptake (mol/g)	% Dispersion
$NiMo/Al_2O_3$	3.52	1.41
$NiMo/F\text{-}Al_2O_3$	4.85	1.95
$NiMo/SiO_2$	2.27	0.91
$NiMo/TiO_2$	5.45	2.19
NiMo/C	2.94	1.18
$NiMo/CeO_2\text{-}ZrO_2$	1.83	0.73

Among NiMo catalysts, $NiMo/TiO_2$ had the highest percent metal dispersion in the same trend of Pd/TiO_2. These indicated that TiO_2 support has the ability lead to the high dispersion of metal, thus the activity of this support catalyst tend to be high. The other NiMo catalyst had the percent metal dispersion about 0.9-1.9.

CURRICULUM VITAE

Name: Ms. Rutkorn Chinsutthi

Date of Birth: October 29, 1986

Nationality: Thai

University Education:

2005–2009 Bachelor Degree of Chemical Engineering, Faculty of Engineering, King Mongkut's Institute of Technology Ladkrabang, Bangkok, Thailand

Work Experience:

2008 Position: Process Engineer Internship Student
Company: Foster Wheeler International Corporation, Chonburi, Thailand

Presentations:

1. Chinsutthi, R.; Jongpatiwut, S.; Sreethawong, T.; Butnark, S.; and Osuwan, S. (2011, January 5-7) Deoxygenation of Animal Fats for the Production of Hydrogenated Biodiesel: Effect of Catalyst Supports. Poster presented at Pure and Applied Chemistry International Conference 2011, Bangkok, Thailand.
2. Chinsutthi, R.; Jongpatiwut, S.; Sreethawong, T.; Butnark, S.; and Osuwan, S. (2011, April 11-14) Deoxygenation of Beef Fat over Different Pd Supported Catalysts. Poster presented at First EuCheMS Inorganic Chemistry Conference, Manchester, United Kingdom.
3. Chinsutthi, R.; Jongpatiwut, S.; Sreethawong, T.; Butnark, S.; and Osuwan, S. (2011, April 26) Deoxygenation of Beef Fat for the Production of Hydrogenated Biodiesel over Pd and NiMo Catalysts with Various Supports. Poster presented at The 2nd Research Symposium on Petroleum, Petrochemicals, and Advanced Materials and the 17th PPC Symposium on Petroleum, Petrochemicals, and Polymers, Bangkok, Thailand.