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APPENDICES

Appendix A Calibration Curve of Gas Products

The relationship between the peak area from GC analysis and the gas concentration was conducted for the possible gas products such as hydrogen, oxygen, carbon monoxide, carbon dioxide, and methane.

Hydrogen (H_2)

Peak Area	Amount (%mole, %vol)
0	0
9138.33	10.88
19336	19.45
38604.33	32.46
67498.33	48.63
78168.67	54.43

Carbon monoxide (CO)

Peak Area	Amount (%mole, %vol)
0	0
83632.33	1.01
149788.70	1.83
361870	4.43
475915.7	5.97
532443	6.63

Carbon dioxide (CO_2)

Peak Area	Amount (%mole, %vol)
0	0
792783	7.08
1350102	13.08
1682067	16.72
2239924	22.79
2944038	30.29

Methane (CH_4)

Peak Area	Amount (%mole, %vol)
0	0
652987	10.70
1246611	19.28
1740062	26.28
2380169	36.44
2780442	44.03

Oxygen (O_2)

Peak Area	Amount (%mole, %vol)
0	0
555890.7	7.31
947920	13.06
1313728	18.32
1627129	22.88
1810142	27.15

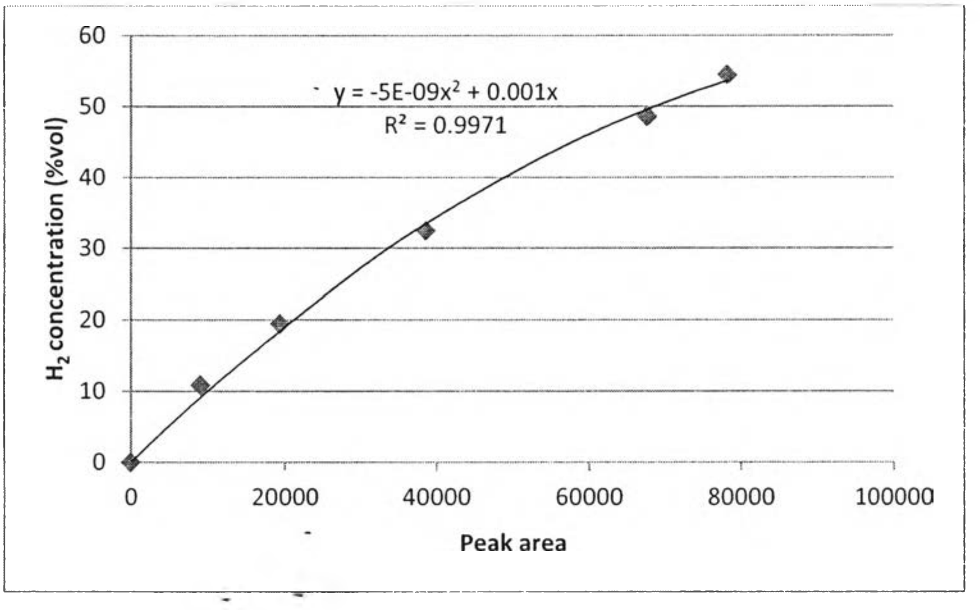

Figure A1 Calibration curve of hydrogen gas.

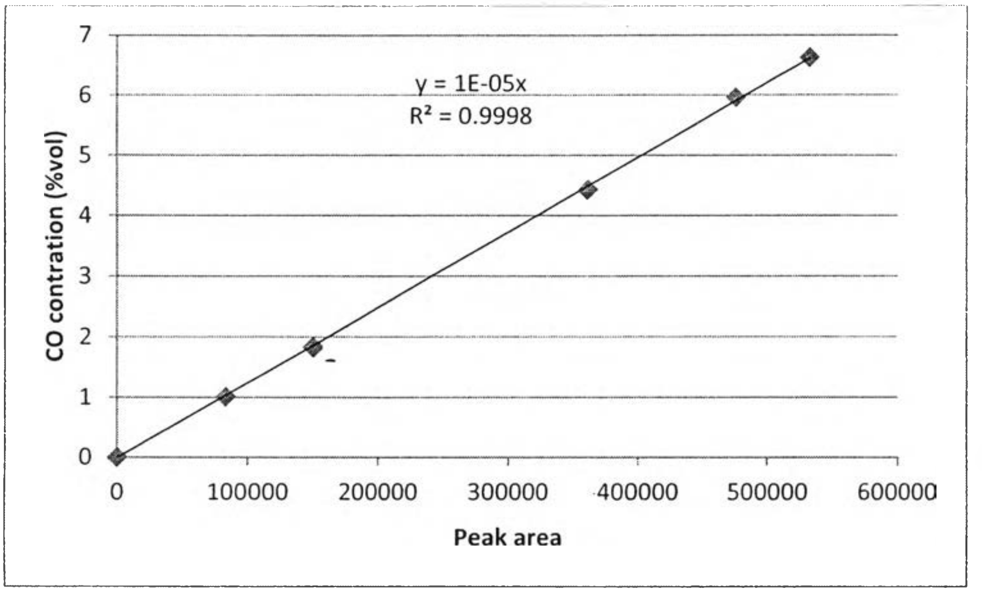

Figure A2 Calibration curve of carbon monoxide gas.

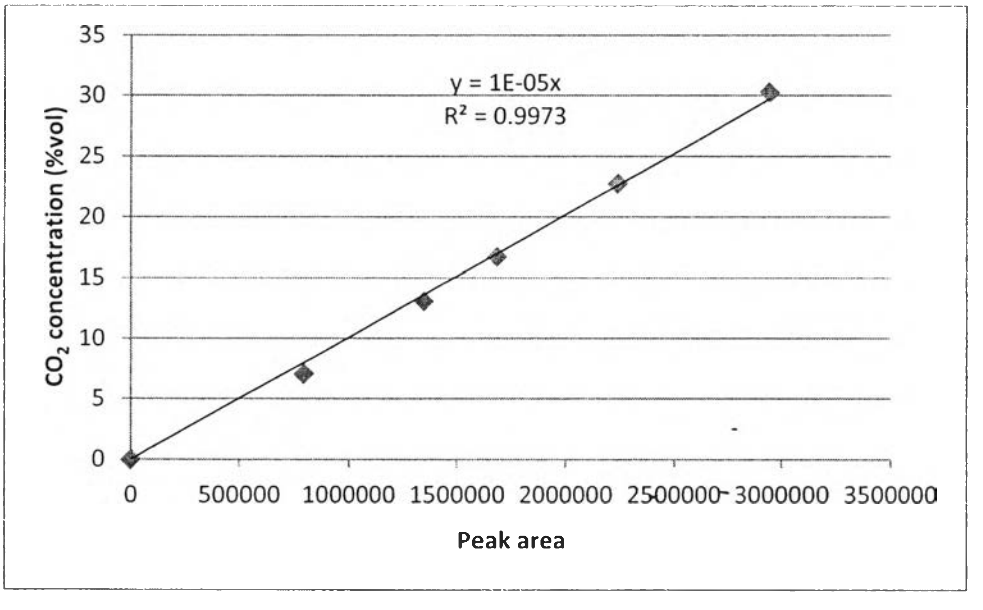

Figure A3 Calibration curve of carbon dioxide gas.

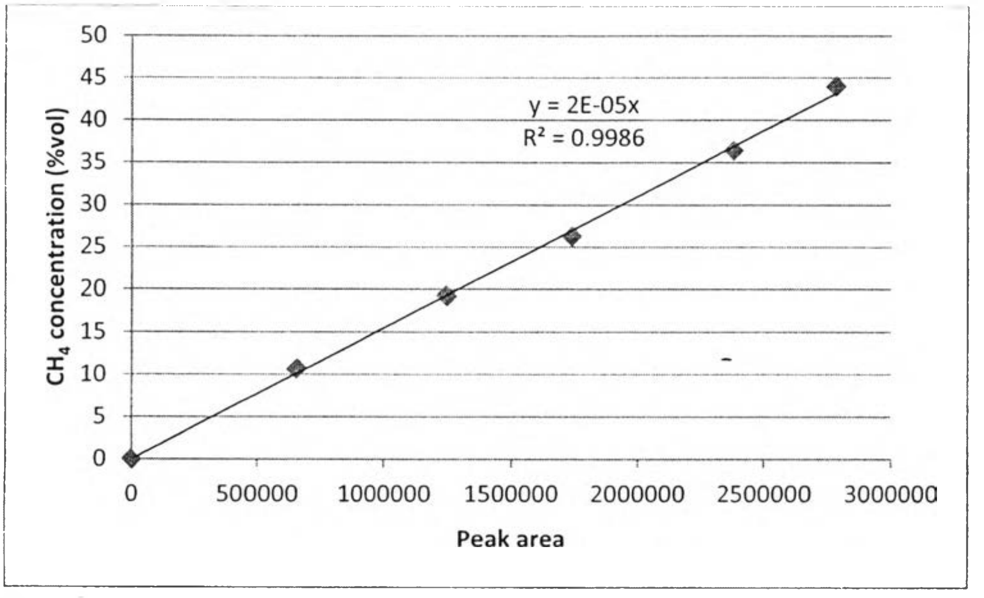

Figure A4 Calibration curve of methane gas.

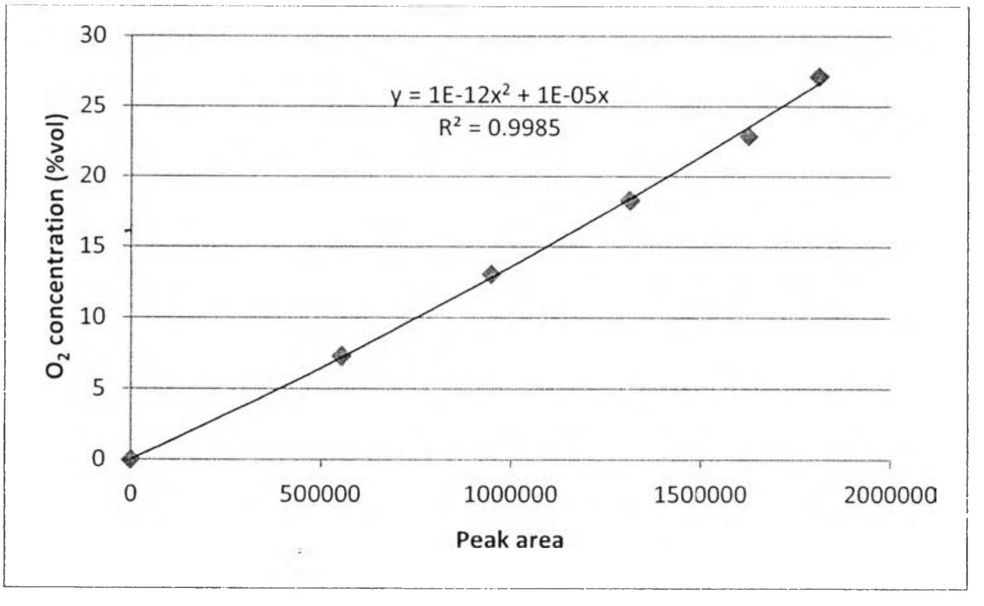

Figure A5 Calibration curve of oxygen gas.

Where x is peak area from GC analysis

y is gas concentration (%)

Appendix B Calibration Curve of Liquid Methanol

Peak Area	Concentration (M)
0	0
9304.82	4
19580.17	8
22489.77	10
37450.87	15

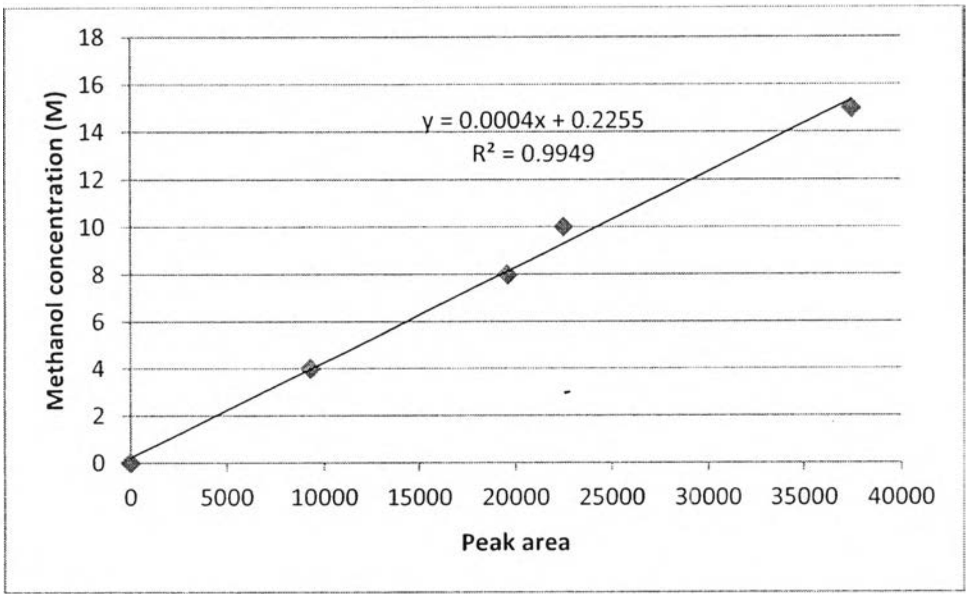

Figure B1 Calibration curve of liquid methanol.

Where x is peak area from GC analysis

y is methanol concentration (M)

CURRICULUM VITAE

Name: Ms. Achiraya Kumyam

Date of Birth: July 29, 1990

Nationality: Thai

University Education:

2012–2014 Master of Science in Petrochemical Technology, The Petroleum and Petrochemical College (PPC), Chulalongkorn University, Bangkok, Thailand.

2009–2012 Bachelor of Science in Chemical Technology, Chulalongkorn University, Bangkok, Thailand.

Working Experience:

2011-2012	Position:	Internship
	Company name:	PTT Public CO., LTD.

Presentations:

1. Kumyam,A.; Luengnaruemitchai, A.; and Dubas, S. T. (2014, April 22) Oxidative Steam Reforming of Methanol over Au–based Catalysts: Effect of Support Composition and Bimetallic. Poster presented at The 5th Research Symposium on Petrochemical and Materials Technology and The 20th PPC Symposium on Petroleum, Petrochemicals, and Polymers, Bangkok, Thailand.
2. Kumyam,A.; Luengnaruemitchai, A.; and Dubas, S. T. (2014, May 7) Hydrogen Production by Oxidative Steam Reforming of Methanol over Au–Cu/CeO_2–ZrO_2 catalyst. Poster presented at The International Conference on Environment and Renewable Energy, Paris, France.