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APPENDICES

Acid Number Analysis				
Normality of KOH	0.01	N		
Volume of blank	2.425	mL		
MW of KOH	56	mg/mmol		
Week 1				
Sample Code	Sample mass (g)	Volume of KOH needed (mL)	Acid number (mg KOH/g sample)	Standard dev
B100-A	2.5070	3.4000	0.2345	
B100-B	2.5125	3.1500	0.1783	0.0398
B100-Ad-A	2.5025	2.9500	0.1343	
B100-Ad-B	2.5045	3.1500	0.1789	0.0315
Week 2				
Sample code	Sample mass (g)	Volume of KOH needed (mL)	Acid number (mg KOH/g sample)	Standard dev
B100-A	2.5023	3.5000	0.2574	
B100-B	2.5090	3.6000	0.2790	0.0153
B100-Ad-A	2.5057	3.4000	0.2347	
B100-Ad-B	2.5186	3.2500	0.2001	0.0244
Week 3				
Sample code	Sample mass (g)	Volume of KOH needed (mL)	Acid number (mg KOH/g sample)	Standard Dev
B100-A	2.5021	3.8000	0.2854	
B100-B	2.5112	3.7000	0.2620	0.0165
B100-Ad-A	2.5040	3.3500	0.1845	
B100-Ad-B	2.5178	3.4000	0.1946	0.0071
Week 4				
Sample code	Sample mass (g)	Volume of KOH needed (mL)	Acid number (mg KOH/g sample)	Standard dev
B100-A	2.5244	3.8000	0.2939	
B100-B	2.5050	3.7000	0.2739	0.0142
B30-Ad-A	2.5300	3.3000	0.1826	
B30-Ad-B	2.5048	3.3500	0.1956	0.0092
Week 5				
Sample code	Sample mass (g)	Volume of KOH needed (mL)	Acid number (mg KOH/g sample)	Standard dev
B100-A	2.5070	3.8000	0.2904	
B100-B	2.5105	3.8500	0.3011	0.0076
B100-Ad-A	2.5126	3.4000	0.2006	
B100-Ad-B	2.5109	3.4000	0.2007	0.0001

Iodine Value Analysis				
Normality of Na2S2O3	0.1	N		
MW of KOH	126.9	mg/mmol		
Volume of blank	33.225	mL		
Week 0				
Sample Code	Sample mass (g)	Volume of N2S2O3 needed (mL)	Iodine value (g I2/100 g sample)	Standard dev
B100-A	0.1538	26.7500	53.4251	
B100-B	0.1549	26.7500	53.0457	0.2683
B100-Ad-A	0.1520	26.8000	53.6403	
B100-Ad-B	0.1521	26.7500	54.0222	0.2700
Volume of blank	33.1	mL		
Week 1				
Sample Code	Sample mass (g)	Volume of N2S2O3 needed (mL)	Iodine value (g I2/100 g sample)	Standard Dev
B100-A	0.1530	26.7000	53.0824	
B100-B	0.1514	26.6500	54.0624	0.6930
B100-Ad-A	0.1543	26.6000	53.4576	
B100-Ad-B	0.1556	26.5000	53.8265	0.2609
Volume of blank	32.85	mL		
Week 2				
Sample Code	Sample mass (g)	Volume of N2S2O3 needed (mL)	Iodine value (g I2/100 g sample)	Standard Dev
B100-A	0.1549	26.6000	51.2024	
B100-B	0.1547	26.5500	51.6787	0.3368
B100-Ad-A	0.1535	26.4500	52.9094	
B100-Ad-B	0.1532	26.5000	52.5989	0.2196
Volume of blank	32.8	mL		
Week 3				
Sample Code	Sample mass (g)	Volume of N2S2O3 needed (mL)	Iodine value (g I2/100 g sample)	Standard dev
B100-A	0.1556	26.5500	50.9720	
B100-B	0.1523	26.6000	51.6599	0.4864
B100-Ad-A	0.1530	26.5000	52.2529	
B100-Ad-B	0.1541	26.5000	51.8799	0.2637
Volume of blank	32.825	mL		
Week 4				
Sample Code	Sample mass (g)	Volume of N2S2O3 needed (mL)	Iodine value (g I2/100 g sample)	Standard dev
B100-A	0.1538	26.6500	50.9498	
B100-B	0.1523	26.6500	51.4516	0.3548
B100-Ad-A	0.1543	26.5000	52.0183	
B100-Ad-B	0.1540	26.6000	51.2956	0.5110

Kinematic Viscosity (cSt)	Week	
	2	4
B100	4.470	4.463
B100-AD	4.504	4.512
B-TBHQ	-	4.783

Induction Period (minutes)		
Week	2	4
B100	1441	660
B-AD	1837	1680
B-TBHQ	-	1685

Rancimat and Kinematic Viscosity week 2

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ANALYSIS REPORT
No. 00225/BBM/SO/04/21

Customer Name	:	IBU VALERIE ANDREWS	Unit No/SN	:	
Address	:		Eng. Type/Model	:	
For Customer	:	IBU VALERIE ANDREWS	Sample Name	:	BIODIESEL B 100
Eng Location	:		Typical	:	BIODIESEL (EBTKE No. 189 K/10/DJE/2019)

Test Detail				Overall Analysis Result	
Lab Number			00181/F/21		
Sample Date					
Receive Date			2021-04-15		
Analysis Date			-		
Report Date			2021-04-30		
Hours on Oil					
Hours on Unit					
Sample Name			BIODIESEL B 100		
No	**Parameter**	**Unit**	**Method**	**Result**	**Typical**
1	Kinematic Viscosity at 40°C (SNI 7182)	cSt	SNI 7182:2015	4.470	2.3-6.0
2	Oxidation Stability by Rancimat (SNI 7182) ++)	Minutes	SNI 7182:2015	1441	Min. 600

Berdasarkan Standar dan Mutu Spesifikasi Bahan Bakar Nabati (BIOFUEL) Jenis Biodiesel Sebagai Bahan Bakar Lain Yang Dipasarkan Di Dalam Negeri No. 189 K/10/DJE/2019

"Worldwide Fuel Character 2013

Remark

Manager Teknis

Catatan : Data analisa hanya berlaku untuk sample yang diuji di laboratorium PT. Petrolab Services
Pengaduan tidak dilayani setelah 30 hari dari tanggal report di terbitkan
Report tidak boleh digandakan tanpa persetujuan tertulis dari laboratorium.

Notes : N=Normal, B=Attention, C=Urgent, D=Severe
*) Di luar ruang lingkup Akreditasi
**) Parameter Subcontract

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ANALYSIS REPORT

No. 00226/BBM/SO/04/21

Customer Name	:	IBU VALERIE ANDREWS	Unit No/SN	:	
Address	:		Eng. Type/Model	:	
For Customer	:	IBU VALERIE ANDREWS	Sample Name	:	BIODIESEL B 100 + ADDITIVE
Eng Location	:		Typical	:	BIODIESEL (EBTKE No. 189 K/10/DJE/2019)

Test Detail				Overall Analysis Result	
Lab Number			00182/F/21		
Sample Date					
Receive Date			2021-04-15		
Analysis Date			-		
Report Date			2021-04-30		
Hours on Oil					
Hours on Unit					
Sample Name			BIODIESEL B 100 + ADDITIVE		
No	**Parameter**	**Unit**	**Method**	**Result**	**Typical**
1	Kinematic Viscosity at 40°C (SNI 7182)	cSt	SNI 7182:2015	4.504	2.3-6.0
2	Oxidation Stability by Rancimat (SNI 7182) ++)	Minutes	SNI 7182:2015	1837	Min. 600

Berdasarkan Standar dan Mutu Spesifikasi Bahan Bakar Nabati (BIOFUEL) Jenis Biodiesel Sebagai Bahan Bakar Lain Yang Dipasarkan Di Dalam Negeri No. 189 K/10/DJE/2019

""Worldwide Fuel Character 2013

Remark

Manager Teknis

Catatan : Data analisa hanya berlaku untuk sample yang diuji di laboratorium PT. Petrolab Services
Pengaduan tidak dilayani setelah 30 hari dari tanggal report di terbitkan
Report tidak boleh digandakan tanpa persetujuan tertulis dari laboratorium.

Notes : N=Normal, B=Attention, C=Urgent, D=Severe

[*] Di luar ruang lingkup Akreditasi

[**] Parameter Subcontract

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Rancimat and Viscosity week 4

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ANALYSIS REPORT
No. 00255/BBM/SO/05/21

Customer Name	: IBU VALERIE ANDREWS	Unit No/SN	:
Address	:	Eng. Type/Model	:
For Customer	: IBU VALERIE ANDREWS	Sample Name	: BIODIESEL
Eng Location	:	Typical	: BIODIESEL (EBTKE No. 189 K/10/DJE/2019)

Test Detail				Overall Analysis Result	
Lab Number			00218/F/21		
Sample Date			2021-04-29		
Receive Date			2021-05-05		
Analysis Date			-		
Report Date			2021-05-24		
Hours on Oil			1 Month(s)		
Hours on Unit					
Sample Name			BIODIESEL		
No	**Parameter**	**Unit**	**Method**	**Result**	**Typical**
1	Kinematic Viscosity at 40°C (SNI 7182)	cSt	SNI 7182:2015	4.463	2.3-6.0
2	Oxidation Stability by Rancimat (SNI 7182) ++)	Minutes	SNI 7182:2015	660	Min. 600

Berdasarkan Standar dan Mutu Spesifikasi Bahan Bakar Nabati (BIOFUEL) Jenis Biodiesel Sebagai Bahan Bakar Lain Yang Dipasarkan Di Dalam Negeri No. 189 K/10/DJE/2019

**Worldwide Fuel Character 2013

Remark

Manager Teknis

Endriastuti, S.Si

Catatan : Data analisa hanya berlaku untuk sample yang diuji di laboratorium PT. Petrolab Services
Pengaduan tidak dilayani setelah 30 hari dari tanggal report di terbitkan
Report tidak boleh digandakan tanpa persetujuan tertulis dari laboratorium.

Notes : N=Normal, B=Attention, C=Urgent, D=Severe
*) Di luar ruang lingkup Akreditasi
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ANALYSIS REPORT

No. 00256/BBM/SO/05/21

Customer Name	:	IBU VALERIE ANDREWS	Unit No/SN	:	
Address	:		Eng. Type/Model	:	
For Customer	:	IBU VALERIE ANDREWS	Sample Name	:	BIODIESEL + ADDITIF
Eng Location	:		Typical	:	BIODIESEL (EBTKE No. 189 K/10/DJE/2019)

Test Detail				Overall Analysis Result	
Lab Number			00219/F/21		
Sample Date			2021-04-29		
Receive Date			2021-05-05		
Analysis Date			-		
Report Date			2021-05-24		
Hours on Oil			1 Month(s)		
Hours on Unit					
Sample Name			BIODIESEL + ADDITIF		
No	**Parameter**	**Unit**	**Method**	**Result**	**Typical**
1	Kinematic Viscosity at 40°C (SNI 7182)	cSt	SNI 7182:2015	4.512	2.3-6.0
2	Oxidation Stability by Rancimat (SNI 7182) ++)	Minutes	SNI 7182:2015	1680	Min. 600

Berdasarkan Standar dan Mutu Spesifikasi Bahan Bakar Nabati (BIOFUEL) Jenis Biodiesel Sebagai Bahan Bakar Lain Yang Dipasarkan Di Dalam Negeri No. 189 K/10/DJE/2019

**Worldwide Fuel Character 2013

Remark

Manager Teknis

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Catatan : Data analisa hanya berlaku untuk sample yang diuji di laboratorium PT. Petrolab Services
Pengaduan tidak dilayani setelah 30 hari dari tanggal report di terbitkan
Report tidak boleh digandakan tanpa persetujuan tertulis dari laboratorium.

Notes : N=Normal, B=Attention, C=Urgent, D=Severe

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ANALYSIS REPORT

No. 00257/BBM/SO/05/21

Customer Name	:	IBU VALERIE ANDREWS	Unit No/SN	:	
Address	:		Eng. Type/Model	:	
For Customer	:	IBU VALERIE ANDREWS	Sample Name	:	BIODIESEL + TBHQ
Eng Location	:		Typical	:	BIODIESEL (EBTKE No. 189 K/10/DJE/2019)

Test Detail				Overall Analysis Result	
Lab Number			00220/F/21		
Sample Date			2021-05-04		
Receive Date			2021-05-05		
Analysis Date			-		
Report Date			2021-05-24		
Hours on Oil					
Hours on Unit					
Sample Name			BIODIESEL + TBHQ		
No	**Parameter**	**Unit**	**Method**	**Result**	**Typical**
1	Kinematic Viscosity at 40°C (SNI 7182)	cSt	SNI 7182:2015	4.783	2.3-6.0
2	Oxidation Stability by Rancimat (SNI 7182) ++)	Minutes	SNI 7182:2015	1685	Min. 600

Berdasarkan Standar dan Mutu Spesifikasi Bahan Bakar Nabati (BIOFUEL) Jenis Biodiesel Sebagai Bahan Bakar Lain Yang Dipasarkan Di Dalam Negeri No. 189 K/10/DJE/2019

"Worldwide Fuel Character 2013

Remark

Manager Teknis

Catatan : Data analisa hanya berlaku untuk sample yang diuji di laboratorium PT. Petrolab Services
Pengaduan tidak dilayani setelah 30 hari dari tanggal report di terbitkan
Report tidak boleh digandakan tanpa persetujuan tertulis dari laboratorium.

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Paired T-test for acid number, iodine value, and kinematic viscosity

t-Test: Paired Two Sample for Means
Acid Value between b100 and b100-ad

	B100	*B100-ad*
Mean	0.2856	0.19068
Variance	0.00361098	0.0004949
Observations	5	5
Pearson Correlation	0.41965857	
Hypothesized Mean Differenc	0	
df	4	
t Stat	3.88554795	
P(T<=t) one-tail	0.00887875	
t Critical one-tail	2.13184679	
P(T<=t) two-tail	0.0177575	
t Critical two-tail	2.77644511	

B100	***B100-AD***
0.2064	0.1566
0.2682	0.2174
0.2737	0.1896
0.2839	0.1891
0.2958	0.2007

Ho = B100 = B100-AD
Ha = B100 is significantly different from B100-AD
P value < 0,05 (from p-two tail)
Reject Ho

t-Test: Paired Two Sample for Means
Iodine Value between B100 and B100-AD

	B100	*B100-ad*
Mean	52.1529906	52.790165
Variance	1.32533173	0.9046742
Observations	5	5
Pearson Correlation	0.92387938	
Hypothesized Mean Differenc	0	
df	4	
t Stat	-3.13353458	
P(T<=t) one-tail	0.01753276	
t Critical one-tail	2.13184679	
P(T<=t) two-tail	0.03506552	
t Critical two-tail	2.77644511	

B100	**B100-AD**
53.2354	53.8312
53.5724	53.6420
51.4406	52.7542
51.3160	52.0664
51.2007	51.6570

Ho = B100 = B100-AD
Ha = B100 is significantly different from B100-AD
P value < 0,05
Reject Ho

t-Test: Paired Two Sample for Means
Kinematic viscosity between B100 and B100-AD

	B100	*B100-ad*
Mean	4.4665	4.508
Variance	2.45E-05	3.2E-05
Observations	2	2
Pearson Correlation	-1	
Hypothesized Mean Differenc	0	
df	1	
t Stat	-5.53333333	
P(T<=t) one-tail	0.0569116	
t Critical one-tail	6.31375151	
P(T<=t) two-tail	0.11382319	
t Critical two-tail	12.7062047	

B100	**B100-ad**
4.47	4.504
4.463	4.512

Ho = B100 = B100-ad
Ha = B100 is significantly different from B100-AD
P value > 0,05
Accepts Ho
Not significantly different

CURRICULUM VITAE

Valerie Andrews

CAREER OBJECTIVE

I am a fresh graduate from Swiss German University currently looking for a dynamic and innovative job to start my career. I majored in Chemical Engineering concentrating on sustainable energy and environment.

HOW TO REACH ME

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LinkedIn: https://www.linkedin.com/in/valerie-andrews-651aa5214/

SKILLS

- Energy Audit, Energy and Material Balance, Organic Chemistry, Environmental Chemistry, Water treatment and purification, Process equipment design, Graphic design.
- Software: Microsoft Word, Microsoft Excel, Microsoft Powerpoint, Adobe Photoshop, Procreate
- Language: Bahasa Indonesia, English, German

EDUCATION

Ernst Abbe Hochschule, Jena, Germany
Double degree program (Environmental Engineering and Development)

- Attended 2019 - 2021 for Student Exchange program

Swiss German University
Bachelor's Degree (Chemical Engineering)

- Attended 2017 - 2021
- Member of the advisory department of the student organization
- Secretary of the Association of Chemical Engineering Students at the Swiss German University
- Juror in der National University Debate Championship (NUDC), Indonesia

SMA Mondial
IPA / Science Major

- Attended 2014 - 2017
- English club committee, debater, and adjudicator
- Best Speaker at SMA Harapan Satu debate competition

WORK EXPERIENCE

Intern at Institute for Biogas, Waste Management and Energy, Weimar, Germany
2019 - 2020

- Arranged and updated the new edition of "Communicating Biogas", a booklet focused on promoting biogas around the EU which is published every year
  Link to the booklet: https://www.ibbaworkshop.eu/communicating-biogas-second-edition/
- Worked on Coastal Biogas website to promote awareness about eutrophication in the Baltic sea
  Link to website: https://www.coastal-biogas.eu/
- Created online learning materials about eutrophication in the Baltic sea for EU students
- Conducted plant visit to Agrargenossenchaft Königsee e.G.
- Conducted plant visit to Hofkonsum der Agrar e.G Heberndorf
- Biogas plant visit in the city of Schleusingen
- Translated booklet articles from German to English
- Arranged partnership with Köreco, Coca-cola Switzerland, Greenpeace, atmosfair, and several American companies and arranged an article to promote their renewable energy project
- Arranged several interviews for an experts advice on biogas for the booklet

Intern at PT. Cicor Panatec, Batam, Indonesia
2018 - 2019

- Performed energy audit for company's production site
- Troubleshooting sources of energy loss and coming up with different solutions to reduce energy costs
- Conduct regular machine checks to calculate energy consumption
- Arranged new energy-saving ideas and solutions to reduce the company's energy cost

Tutor
2017 - 2019

- Tutor for elementary school students in math, English, science, and Bahasa Indonesia