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## **Symposium Program**

Day 1: Tuesday, August 6th, 2019 Venue: IPB International Convention Center (IICC), Botani Square, Jl. Pajajaran, Bogor, West Java Indonesia

Registration	Java Indonesia								
08.45-09.10         Welcoming Speech           09.15-09.30         Opening Ceremony           09.30-09.55         Plenary session Invited Speaker session: Assoc Prof Yuan-Chung Cheng           10.20-10.35         Discussion           10.35-11.00         Plenary session Invited Speaker session: Prof Masaki Kita           11.00-11.25         Plenary session Invited Speaker session: Prof Dr Dyah Iswantini           11.25-11.40         Discussion           11.40-12.10         Technical Presentation           12.10-13.15         Lunch           Poster Session I and Sponsor Stand Tour           Parallel session           Ballroom 1 Invited Speaker: Shuichi Shimma, Ph.D OP A1-A5         Ballroom 2 Invited Speaker: Shuichi Shimma, Ph.D OP A1-A5         Meeting Room D Invited Speaker: Novriyandi Hanif, D.Sc OP D1-D5         Meeting Room D Invited Speaker: Novriyandi Hanif, D.Sc OP D1-D5         Meeting Room D Invited Speaker: Novriyandi Room F OP G1 - G7         Prof Asep Kadarohman OP E1-E5         Dr. Dodi Safari OP F1-F5           Meeting Room F OP G1 - G7         Adenium Room OP H1 - H7         OP F1-F5         Meeting Room B Invited Speaker: Novriyandi Room C OP B6 - B10         Meeting Room B: OP G1 - C10           Meeting Room C: OP B6 - B10         OP B6 - B10         OP C6 - C10         Meeting Room B: OP G8 - G12         OP B6 - B10         OP F6 - F10           Meeting Room F: OP G8 - G12         Adenium Room	Time	Agenda							
09.10-09.15         Opening Ceremony           09.15-09.30         Coffee Break           09.30-09.55         Plenary session Invited Speaker session: Prof Tsuyoshi Kawai           09.55-10.20         Plenary session Invited Speaker session: Assoc Prof Yuan-Chung Cheng           10.20-10.35         Discussion Plenary session Invited Speaker session: Prof Masaki Kita           11.00-11.25         Plenary session Invited Speaker session: Prof Dr Dyah Iswantini           11.25-11.40         Discussion           12.10-13.15         Lunch           13.15-14.00         Poster Session I and Sponsor Stand Tour           14.00-15.30         Parallel session           Ballroom 1         Ballroom 2         Invited Speaker: Shuichi Shinma, Ph.D         Meeting Room B           OP A1-A5         OP B1-B5         OP C1-C5           Meeting Room C         Meeting Room D         Invited Speaker: Noviryandi Hanif, D.Sc         OP E1-E5         OP F1-F5           Meeting Room F         Adenium Room         Dr. Dodi Safari         OP P1-D5         OP P1-D5         OP B1-B7         OP P1-P5         OP P1-	08.00-08.45	Registration							
O9.15–09.30         Coffee Break           09.30–09.55         Plenary session           109.55–10.20         Plenary session           10.20–10.35         Discussion           10.35–11.00         Plenary session           10.00–11.25         Plenary session           11.00–11.25         Plenary session           11.40–12.10         Discussion           11.40–12.10         Technical Presentation           12.10–13.15         Lunch           13.15–14.00         Poster Session I and Sponsor Stand Tour           4.00–15.30         Parallel session           Ballroom 1         Ballroom 2           Invited Speaker:         Invited Speaker:           Shuichi Shinma, Ph.D         Akhmad Sabarudin, D.Sc           OP A1-A5         OP B1-B5           Meeting Room C         Invited Speaker:           Invited Speaker:         Invited Speaker:           Norriyandi Hanif, D.Sc         OP E1-E5           OP D1-D5         OP E1-E5           Meeting Room F         Adenium Room         OP I1-I7           15.30–16.00         Coffee Break           16.00–16.50         Ballroom 1:         Ballroom 2:         Meeting Room B:           OP A6 – A10         OP B6 –	08.45-09.10								
Op.30-09.55   Plenary session   Invited Speaker session: Prof Tsuyoshi Kawai	09.10-09.15								
Invited Speaker session: Prof Tsuyoshi Kawai	09.15-09.30	Coffee Break							
Description   Plenary session   Invited Speaker session: Assoc Prof Yuan-Chung Cheng	09.30-09.55	Plenary session							
Invited Speaker session: Assoc Prof Yuan-Chung Cheng									
10.20-10.35   Discussion	09.55-10.20								
10.35-11.00									
Invited Speaker session: Prof Masaki Kita		(4PE) 20 TA - 40 TO ST (4PA 10 TA 10							
11.00-11.25	10.35-11.00								
Invited Speaker session: Prof Dr Dyah Iswantini									
11.25-11.40   Discussion   Technical Presentation   12.10-13.15   Lunch   Dester Session I and Sponsor Stand Tour   14.00-15.30   Parallel session   Ballroom 2   Invited Speaker: Shuichi Shinma, Ph.D   Akhmad Sabarudin, D.Sc   OP A1-A5   OP B1-B5   OP C1-C5   Meeting Room C   Invited Speaker: Invited Speaker: Novriyandi Hanif, D.Sc   OP B1-B5   OP E1-E5   OP F1-F5   Meeting Room F   OP G1-G7   OP H1-H7   OP H1-I7   OP H1-I7   OP G6-C10   Meeting Room C: OP B6-B10   OP C6-C10   Meeting Room C: OP B6-B10   OP C6-C10   Meeting Room F: OP G8-G12   OP H8-H12   OP I8-I12   16.50-17.00   Discussion   OP H8-H12   OP I8-I12   OP I8-II2   OP I8-II12   OP I8-II2   OP	11.00-11.25								
11.40-12.10   Technical Presentation	44.05.44.40								
12.10-13.15   Lunch									
13.15-14.00   Poster Session I and Sponsor Stand Tour									
Dallroom 1									
Ballroom 1									
Invited Speaker: Shuichi Shinma, Ph.D OP A1-A5 OP B1-B5 OP C1-C5	14.00-15.50								
Shuichi Shinma, Ph.D   OP A1-A5   OP B1-B5   OP C1-C5									
OP A1-A5									
Meeting Room C									
Invited Speaker:   Invited Speaker:   Invited Speaker:   Novriyandi Hanif, D.Sc   Prof Asep Kadarohman   Dr. Dodi Safari   OP D1-D5   OP E1-E5   OP F1-F5									
Novriyandi Hanif, D.Sc									
OP D1-D5         OP E1-E5         OP F1-F5           Meeting Room F         Adenium Room         Plumeria Room           OP G1 – G7         OP H1 – H7         OP I1 – I7           15.30–16.00         Coffee Break           16.00–16.50           Parallel session           Ballroom 2:         Meeting Room B:           OP A6 – A10         OP B6 – B10         OP C6 – C10           Meeting Room C:         Meeting Room D:         Meeting Room E:           OP D6 – D10         OP E6 – E10         OP F6 – F10           Meeting Room F:         Adenium Room:         Plumeria Room:           OP G8 – G12         OP H8 – H12         OP I8 – I12           16.50–17.00         Discussion									
Meeting Room F OP G1 - G7         Adenium Room OP H1 - H7         Plumeria Room OP I1 - I7           15.30-16.00         Coffee Break           16.00-16.50         Parallel session           Ballroom 1 : OP A6 - A10         Ballroom 2 : OP B6 - B10         Meeting Room B: OP C6 - C10           Meeting Room C: OP D6 - D10         Meeting Room D: OP E6 - E10         Meeting Room E: OP F6 - F10           Meeting Room F: OP G8 - G12         Adenium Room: OP H8 - H12         OP I8 - I12           16.50-17.00         Discussion				CONTRACTOR OF THE CONTRACTOR O					
OP G1 – G7 OP H1 – H7 OP I1 – I7  15.30–16.00 Coffee Break  16.00–16.50 Parallel session  Ballroom 1: Ballroom 2: Meeting Room B: OP A6 – A10 OP B6 – B10 OP C6 – C10  Meeting Room C: Meeting Room D: Meeting Room E: OP D6 – D10 OP E6 – E10 OP F6 – F10  Meeting Room F: Adenium Room: OP G8 – G12 OP H8 – H12 OP I8 – I12  16.50–17.00 Discussion									
15.30-16.00   Coffee Break									
Ballroom 1 :         Description         Description         Meeting Room B:         OP C6 – C10         Meeting Room B:         OP C6 – C10         Meeting Room D:         Meeting Room E:         OP C6 – C10         Meeting Room E:         OP E6 – E10         OP F6 – F10         OP F6 – F10         Plumeria Room:         OP I8 – I12         OP I8 – II2         OP I8 – II2 <t< td=""><td>15.30-16.00</td><td colspan="8"></td></t<>	15.30-16.00								
OP A6 - A10         OP B6 - B10         OP C6 - C10           Meeting Room C:         Meeting Room D:         Meeting Room E:           OP D6 - D10         OP E6 - E10         OP F6 - F10           Meeting Room F:         Adenium Room:         Plumeria Room:           OP G8 - G12         OP H8 - H12         OP I8 - I12           16.50-17.00         Discussion	16.00-16.50	Parallel session							
OP A6 - A10         OP B6 - B10         OP C6 - C10           Meeting Room C:         Meeting Room D:         Meeting Room E:           OP D6 - D10         OP E6 - E10         OP F6 - F10           Meeting Room F:         Adenium Room:         Plumeria Room:           OP G8 - G12         OP H8 - H12         OP I8 - I12           16.50-17.00         Discussion		Ballroom 1 :	Ballroom 2 :	Meeting Room B:					
OP D6 – D10         OP E6 – E10         OP F6 – F10           Meeting Room F:         Adenium Room:         Plumeria Room:           OP G8 – G12         OP H8 – H12         OP I8 – I12           16.50–17.00         Discussion		OP A6 – A10	OP B6 - B10						
OP D6 – D10         OP E6 – E10         OP F6 – F10           Meeting Room F:         Adenium Room:         Plumeria Room:           OP G8 – G12         OP H8 – H12         OP I8 – I12           16.50–17.00         Discussion		Meeting Room C:	Meeting Room D:	Meeting Room E:					
OP G8 – G12 OP H8 – H12 OP I8 – I12  16.50–17.00 Discussion									
16.50-17.00 Discussion		Meeting Room F:							
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18.30-21.00   Gala Dinner									
	18.30-21.00	Gala Dinner							

Name	ID submision	Code	Day	Room	Time
Siti Nurbayti	268	G20	7 Agt	Room F	13.30-13.40
Sri Kadarwati	346	117	7 Agt	Plumeria Room	11.10-11.20
Sri Mulijani	161	I10	6 Agt	Plumeria Room	16.20-16.30
Sri Mulijani	337	I11	6 Agt	Plumeria Room	16.30-16.40
Sri Sugiarti	73	G11	6 Agt	F Room	16.30-16.40
Sri Yadial Chalid	8	F1	6 Agt	Room E	14.30-14.40
Sry Wahyuni	67	В3	6 Agt	Ballroom 2	14.50-15.00
Sry Wahyuni	205	B8	6 Agt	Ballroom 2	16.20-16.30
Subandi	375	F22	7 Agt	Room E	14.40-14.50
Sudirman	43	18	6 Agt	Plumeria Room	16.00-16.10
Suharso	15	C1	6 Agt	Room B	14.30-14.40
Sutrisno	368	B22	7 Agt	Ballroom 2	14.40-14.50
Syafrizayanti	27	F2	6 Agt	Room E	14.40-14.50
Tanto Budi Susilo	118	H15	7 Agt	Adenium Room	10.50-11.00
Tatas H.P. Brotosudarmo	352	D23	6 Agt	Plumeria Room	16.40-16.50
Teguh Pambudi	122	C5	6 Agt	Room B	15.10-15.20
Triana Kusumaningsih	33	E8	6 Agt	Room D	16.20-16.30
Trianda Ayuning Tyas	105	G13	7 Agt	Room F	10.20-10.30
Uswatun Hasanah	153	B1	6 Agt	Ballroom 2	14.30-14.40
Verra Nurmaylindha	134	H22	7 Agt	Adenium Room	13.50-14.00
Vina Juliana	309	D21	7 Agt	Room C	14.40-14.50
Wahyu Prasetyo Utomo	299	E22	7 Agt	Room D	14.40-14.50
Waringin Margi Yusmaman	144	G24	7 Agt	Room F	14.30-14.40
Wega Trisunaryanti	74	H10	6 Agt	Adenium Room	16.20-16.30
Widia Wati	133	H21	7 Agt	Adenium Room	13.40-13.50
Wilis Okti Pamungkas	338	F19	7 Agt	Room E	14.00-14.10
Winda Andika	355	E6	6 Agt	Room D	16.00-16.10
Wynona Agatha Nimpoeno	84	H12	6 Agt	Adenium Room	16.40-16.50
Yehezkiel Steven Kurniawan	112	B4	6 Agt	Ballroom 2	15.00-15.10
Yessi Permana	125	A20	7 Agt	Ballroom 1	14.20-14.30
Yohanes Martono	246	D15	7 Agt	Room C	11.30-11.40
Yohanis Irenius Mandik	322	B12	7 Agt	Ballroom 2	11.00-11.10
Yosua	354	F21	7 Agt	Room E	14.30-14.40
Yuana Nurulita	148	D8	6 Agt	Room C	16.20-16.30
Yuki Omote	85	G1	6 Agt	F Room	14.00-14.10
Yuki Orikasa	69	E13	7 Agt	Room D	11.10-11.20
Yuki Orikasa	203	I13	7 Agt	Plumeria Room	10.20-10.30
Yulia Eka Putri	139	E17	7 Agt	Room D	13.40-13.50
Yulian Syahputri	377	B20	7 Agt	Ballroom 2	14.20-14.30
Yuningsih Budiman	102	A18	7 Agt	Ballroom 1	13.50-14.00
Yusi Deawati	280	F17	7 Agt	Room E	13.40-13.50
Yusraini Dian Inayati Siregar	36	C3	6 Agt	Room B	14.50-15.00

# Use of LS As Natural Green Inhibitor of Calsium Carbonate Scale Formation

Suharso<sup>1, a)</sup>, Eka Setiososari<sup>1</sup>, Prio Santoso<sup>2</sup>, Agung Abadi Kiswandono<sup>1</sup>, Buhani<sup>1, a)</sup>, and Heri Satria<sup>1</sup>

<sup>1</sup>Department of Chemistry, Faculty of Mathematics and Natural Sciences, University of Lampung, Jalan Prof. Dr. Sumantri Brodjonegoro No. 1 Bandar Lampung, Indonesia 35145

<sup>2</sup>Chemistry Department, Institut Teknologi Sumatera, Lampung Selatan, Lampung, Indonesia

<sup>a)</sup>Corresponding author: suharso s@yahoo.com and buhani s@yahoo.co.id

Abstract. The application of natural green inhibitors to inhibit scale formation of inorganic materials have become a necessity these days considering the many inhibitors are used in the industry are not environmentally friendly and expensive. In this research, it has been investigated the green inhibitors from natural products called LS Inhibitor. Analysis with the GC-MS (gas chromatography–mass spectrometry) shows that the main chemical compositions of LS inhibitor consisted of acetic acid (more than 50 %) and phenol (more than 15 %). Testing of LS inhibitor was performed by seeded experiment method at temperature of 90 °C and concentration of calcium carbonate (CaCO<sub>3</sub>) growth solution of 0.050 M. The results showed that the higher the inhibitor concentration added the greater the effectiveness of the inhibitor in inhibiting the formation of CaCO<sub>3</sub> crystals accompanied by the decrease in pH of the solution. It is concluded that the addition of LS inhibitor in the concentration range of 50-350 ppm in CaCO<sub>3</sub> crystal growth solution at the concentration of 0.050 M is able to inhibit the scale formation of CaCO<sub>3</sub> around 27-278 %.

**Keywords:** Green inhibitor, CaCO<sub>3</sub> crystal, scale formation, seeded experiment.