

1-Day Rheology Workshop on Polymers



Reported by: Nur Anati binti Jamalluddin, Postgraduate Chemistry Club (PCC), Faculty of Applied Sciences, UiTM

Edited by: Prof. Ts. ChM. Dr. Chan Chin Han, UiTM

Date: 28th September 2021

Venue:

Cloud Events Sdn Bhd, (1378708-K), Unit C-2-20, Damen USJ Komersial, Persiaran Kewajipan, USJ 1, 47500, Subang Jaya, Selangor, Malaysia

(Speakers and committee) and

Virtual Online via Zoom Platform (Participants)

Organized by:

Postgraduate Chemistry Club (PCC), UiTM and Institut Kimia Malaysia (IKM)

Collaborators:

Anton Paar (M) Sdn Bhd, Institute of Materials, Malaysia (IMM) and Malaysian Institute of Food Technology (MIFT)



Anton Paar



UiTM 1-Day Rheology Workshop on Polymer highlights : <https://fb.watch/8B1fAy16sG/>



A 1-Day Rheology Workshop on Polymers was successfully held on September 28, 2021 at Cloud Events Sdn Bhd studio, Damen USJ Komersial, Subang Jaya, Selangor, Malaysia. The workshop was organized by the Postgraduate Chemistry Club (PCC), Faculty of Applied Sciences (FSG), Universiti Teknologi MARA (UiTM), and jointly organized by Malaysian Institute of Chemistry (IKM). Anton Paar (M) Sdn Bhd, Institute of Materials, Malaysia (IMM) and Malaysian Institute of Food Technology (MIFT) were the collaborating partners of this workshop. The workshop was conducted live at the Cloud Events Sdn Bhd studio and via the Zoom platform. The virtual workshop was

delivered by 6 experienced speakers from UiTM (Prof. Ts. ChM. Dr. Chan Chin Han, Ms. Hairunnisa Ramli and Ms. Nurul Fatahah Asyqin Zainal) and Anton Paar (M) Sdn Bhd (Mr. Nigel Foong, Mr. Thomas G. Mezger and Mr. Markus Nemeth) and was moderated by Ms. Nur Irdina Syahirah Abd Ghani, a postgraduate student of UiTM Shah Alam. Up to 190 participants from higher learning institutes and private companies attended the one full day of the virtual workshop. The list of the participants is listed in Table 1. The workshop received many positive responses from the participants as shown below:

"Great workshop. Congratulation to organizer"- Mohd Aidy Faizal Johari, MJIIT, UTM KL

"The well-explanation of the specific topic by all presenters"- Nurul Najihah Ilias, USM

"The contents of the workshop are very beneficial"- Nor Munirah Rohaizad, UniMAP

"On the case study, very helpful"- Nurul Adila Mohd Ali, UTHM

"The speakers are all great in explaining and presenting"- Nurul Hidayah Ahmad, UiTM Shah Alam

"Extend the duration of the workshop"- Muhammad Zul Husni Yusni Jaafar, Central Medicare Sdn Bhd

"Keep up the good work"- Peinni Bernardette Estolas, IMM

"The presentation from the Mr. Marcus and Mr. Thomas regarding the concept and some basics of rheology were very useful"- Lee Shoek Yin, Afcona Chemicals Sdn Bhd

"Valuable understanding about rheology of polymer and hands on rheometer"- Chee Pok Hoon, Ansell Industries Gloves

"Insightful presentation on the viscoelastic properties"- Lewis Lum, Synthomer Sdn Bhd

The workshop began with a welcoming speech and the first lecture on the introduction to the thermal opening remarks by the Dean of Faculty of Applied Sciences, UiTM Shah Alam, Prof Dr. Hjh. Farida Zuraina Han, who is also the advisor of the PCC. Her lecture covers the basic concept and the classification of Chemistry, Datuk ChM. Dr. Soon Ting Kueh. They expressed their gratitude towards the great initiative of demonstration of running polymeric samples using a making the virtual educational workshop possible with the rheometer by Mr. Nigel Foong. He emphasized on good practice & precautions for sample analysis and data analysis.

Table 1: Participants of the 1-Day Rheology Workshop on Polymers on September 28, 2021

No	Organization/University	No of Participants	No	Organization/University	No of Participants
1	Alpha Nanotech Sdn Bhd	1	19	Top Glove International Sdn Bhd	6
2	Ansell Global Trading Center (M) Sdn Bhd	5	20	Tunku Abdul Rahman University College (TAR-UC)	11
3	Ansell Industrial & Specialty Gloves (M) Sdn Bhd	7	21	UCSI Malaysia	1
4	Ansell NP Sdn Bhd	3	22	Universiti Kebangsaan Malaysia (UKM)	1
5	Anton Paar (M) Sdn Bhd	6	23	Universiti Kuala Lumpur (UniKL)	4
6	CCM Polymers Sdn Bhd	2	24	Universiti Malaya (UM)	1
7	Central Medicare Sdn Bhd	1	25	Universiti Malaysia Kelantan (UMK)	1
8	Cloud Events (M) Sdn Bhd	5	26	Universiti Malaysia Pahang (UMP)	6
9	Institut Kimia Malaysia (IKM)	8	27	Universiti Malaysia Perlis (UniMAP)	2
10	Institute of Material, Malaysia (IMM)	1	28	Universiti Malaysia Sabah (UMS)	2
11	International Islamic University Malaysia (IIUM)	1	29	Universiti Putra Malaysia (UPM)	9
12	KMK Rubber Manufacturing Sdn Bhd	1	30	Universiti Sains Malaysia (USM)	8
13	Malaysian Institute of Technology (MIFT)	2	31	Universiti Teknologi Malaysia (UTM)	16
14	Malaysian Rubber Board (MRB)	11	32	Universiti Teknologi MARA (UiTM)	50
15	Nilai University	1	33	Universiti Teknologi PETRONAS	1
16	Penchem Technologies Sdn Bhd	5	34	Universiti Tenaga Nasional (UNITEN)	1
17	Synthomer Sdn Bhd	7	35	Universiti Tun Hussein Onn Malaysia (UTHM)	1
18	Taylor's University	1	36	University of Sheffield, UK	1
Total					190

Afterward, Dr. Siti Roha Ab Mutalib, from the Faculty of Applied Sciences, UiTM Shah Alam, gave an interesting insight on the application of rheometer from the perspective of food technology. She provided a demonstration on handling the instrument, emphasized the importance of rheology in food applications, and highlighted some common mistakes. Ms. Nurul Fatahah Asyqin Zainal touched on the basic result interpretation of rheological studies of immiscible polymer blends. It was followed by the hands-on session on data analysis conducted by Ms. Hairunnisa Ramli. Mr. Thomas G. Mezger and Mr. Markus Nemeth highlighted general result interpretation of polymers and some experimental designs such as amplitude sweep, frequency sweep that includes TTS function & temperature sweep.

The participants had the opportunity to ask questions live during the workshop. Scientific and professional communication among participants and speakers was observed. This comprehensive virtual educational workshop comprising fundamentals, theories, demonstration, and hands-on sessions. It was ended with the closing remarks by Ms. Nur Anati binti Jamalluddin, the organizing Vice Chairman of 1-Day Rheology Workshop on Polymers, Postgraduate Chemistry Club (PCC), UiTM Shah Alam. She expressed her appreciation and greatest gratitude to the commitment, determination, and cooperation of all parties for the success of making this workshop.



Figure 1: Opening and closing posters of 1-Day Rheology Workshop on Polymers



Figure 2: Welcoming speech and opening remarks by the Dean of Faculty of Applied Sciences, UiTM Shah Alam, Prof. Dr. Hj. Farida Zuraina Mohd Yusof and President of Malaysian Institute of Chemistry, Datuk ChM. Dr. Soon Ting Kueh.

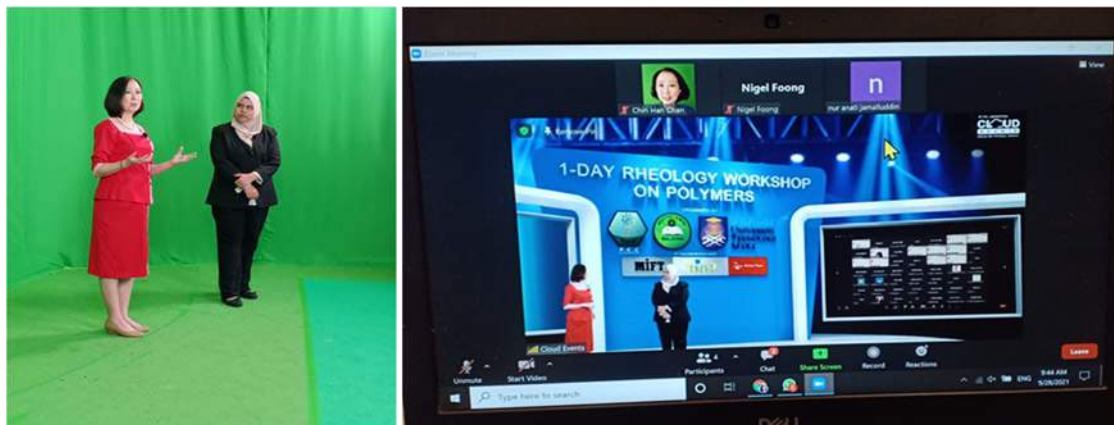


Figure 3: An introduction of the thermal properties of polymers by Prof. Ts. ChM. Dr. Chan Chin Han together with the moderator, Ms. Nur Irdina Syahirah Abd Ghani, at the 1-Day Rheology Workshop on Polymers

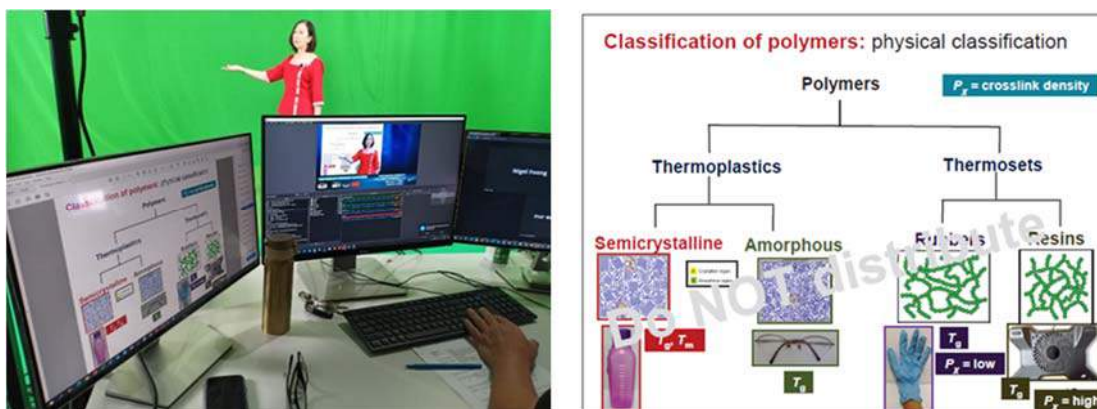


Figure 4: Classification of polymers by Prof. Ts. ChM. Dr. Chan Chin Han



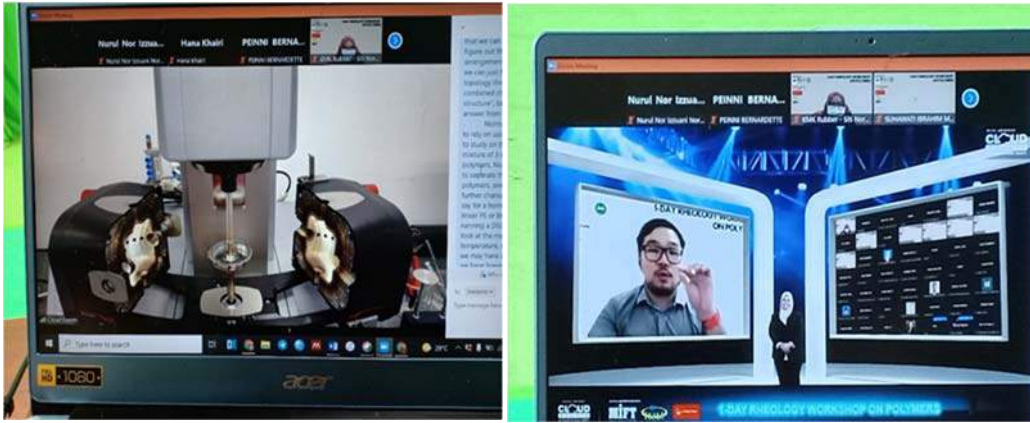


Figure 5: Q&A sessions of Mr Nigel Foong



3. Polymer blends

Compatibilization of polymer blends

Strategies

- polyA/polyB + poly(A-co-B)
- polyA/poly(A-co-B)
- polyA/poly(B-co-C)

Notes:
 polyA does not mix with polyB
 polyA mixes with polyC

Compatibilizer

- Yellow circle: connection with polyA
- Red circle: connection with polyB
- Blue circle: connection with polyA
- Green circle: connection with polyB
- Blue circle: mixed with polyA

Diagram Labels:
 i. polyB
 ii. poly(A-co-B)
 iii. poly(B-co-C)

Figure 6: Viscoelastic behaviour and polymer blends by Ms Nurul Fatahah Asyqin Zainal

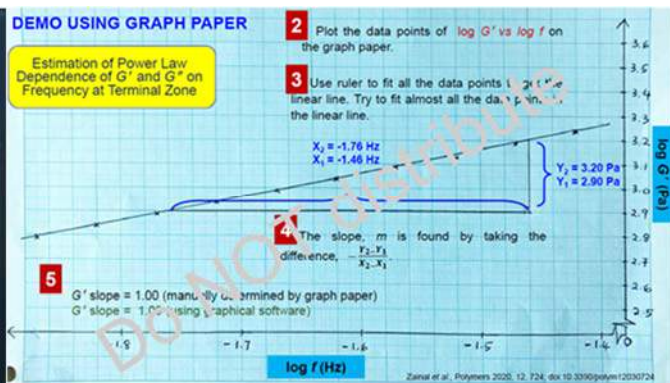
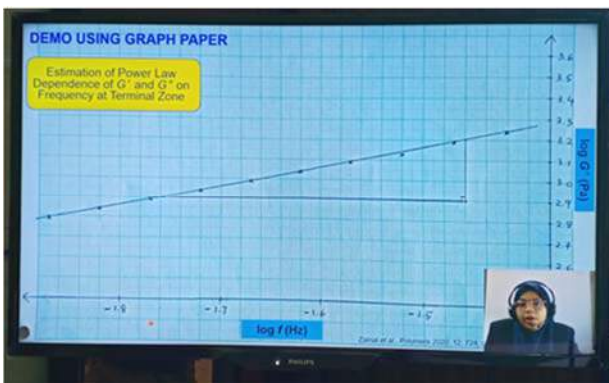
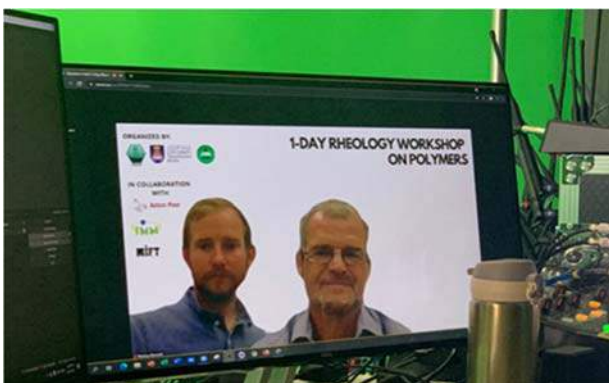


Figure 7: Hands-on session on data analysis conducted by Ms. Hairunnisa Ramli using graph paper



AP Material Characterization Rheology Road

Rheology describes flow and deformation behavior

Anton Paar

coatings, inks, beverages, fuels, self-surfactants	resins, lubricants, sealants, polymer emulsions, polymer dispersions, adhesives, dispersions	printing inks, slurries, paints, building materials, food emulsions, adhesives, sealants, suspensions, dispersions	hydrogels, bio-polymers	sealants, elastomers, adhesives, rubbers	powder coatings, resins, inks, component adhesives, inks, curing materials, thermoplasts, food	polymer films, polymer fibers, polymer bars and foils, coated films, thermoplasts, thermosets, elastomers, rubber
LIQUIDS	VISCOELASTIC LIQUIDS	MELTS	PASTE-LIKE MATERIALS	GEL-LIKE MATERIALS	SOFT SOLIDS	REACTIVE SYSTEMS
almost 100% liquid						SOLIDS almost 100% solid
Rotation	Rotation	Rotation	Rotation	Oscillation	Oscillation	Oscillation
Oscillation	Oscillation	Oscillation	Oscillation	Oscillation	Oscillation	Tension
DG, CC	CP & PP (50-25)	CP25-3 & PP25	CP & PP (25-50)	CP & PP (25-50)	PP25	PP15
CP & PP (60) TI	DG or CC	CP25-3 & PP25	Special	DG, CC	PP15	SRE, UDF, SER

Dynamic Mechanical Analysis DMA

Figure 8: Mr. Thomas G. Mezger and Mr. Markus Nemeth on result interpretation related to rheology, flow and deformation behavior as well as oscillatory test: frequency sweeps and molar mass.



Figure 9: Closing remarks by Ms. Nur Anati Jamalluddin, the Vice Chairman of 1-Day Rheology Workshop on Polymers, Postgraduate Chemistry Club (PCC), UiTM



Figure 10: Photo session at the end of the workshop together with the Postgraduate Chemistry Club committee, speakers and participants



Figure 11: Behind the scenes. Committed crew and committee members in the standby mode for running the workshop in orderly manner.



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HIGHLIGHTS

IMM Student Chapter

Addressing the Issues of Significant Figures for Degree of Similarity and Specific FTIR Fingerprint Regions for Paints: A Pilot Study

Predicting the Whiteness Index of Cotton Fabric with a Least Squares Model



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