Meeting 3

Date	Tuesday, 26 January 2021
Attendees	Dr Ali Yetisen (AY), Marie Jones (MJ), Mathusan Kandiah (MK), Zong Lee (ZL), Yuxin Liu (YL), Mustafa Naser (MN), Helen Ogbobi (HO), Wei Ooi (WO), Andreas Richardson (AR), Stephen Tan (SN), Sathurthini Thurairatnam (ST), Mingchuan Zheng (MZ), Antonia Feilden (AF), Abdullah Ahmed (AA)
Apologies	None
Chair	Andreas Richardson (AR)
Secretary	Yuxin Liu (YL)

Minutes

Item	Discussion
1 – Introduction	AA & AF joining the group; AF is looking at nitration performed in flow, happy to be approached by email/Teams/LinkedIn, suggested in Mendeley (AR: we are using Zotero) AR: reflection on what we have done and how to improve AA: MRes under Klaus, focusing nitration reaction as exemplar case study
2 – Short update on brief negotiation	AR: Sending updated brief today MJ: Updated brief sent to AY as well. Continuous nitration process, products are 4-aminobenzoic acid, 4-aminobenzaldehyde and o-toluidine, application in agrochemical and pharmaceutical. Flexibility and modularity. MN: Location is Nanjing chemical park in China, close to toluene producer, province has large demand and good tax incentives. AY: Clarify modularity? MJ: Switching between two production routes. AY: Good location? MJ: High demand, high feasibility of feedstock and China looking for safe plant designs AY: Domestic or international? MJ: Domestic
3 – Finding our innovation factor & unique selling point	AR: Klaus mentioned innovation and unique selling point is important. Identified four ways of innovation and USP: microreactor, other types of process intensification, pure economic factor (cut price), new business model ZL: Literature found for microreactor for nitration. Microreactor has advantage of small, safe and scalability. How to model? AF: Series of flow plates or traditional reactor (flow reactor)? Flow plates act like chip, put in series and scale up, but Klaus said not a good idea. AR: Long-coiled tube. Consider scaling. AF: Not sure about Aspen. AR: Spinning-disk reactors, hard to find literature. AY: Get the basics right first before starting innovative designs. Assume certain values (educated guess) AA: Focus more on economics side and scalability, difficult for continuous nitration in industry.

	MJ: For interim report innovative or simple design (mass balance)? AY: Simple design first MN: Chemical parks, safety incentive in China. MZ: Subsidies to high-tech HO: Being disruptive as a way of entering market but not applied to our company. Competitive AR: Be a technology provider, manufacture units and sell to customers. Literature on this. Did not go with this option. AF: Identify customer, look at price and areas with highest price. Carbon credit system can be selling point. Reaction pathway can be more green. MJ: Liquid-liquid: nitric acid and sulfuric acid; Solid-liquid: nitic acid and Zeolites AF: Start process design with a patent, suggested SciFinder, Douglas. AA: Photochemical dehydrogenation strategy for aniline synthesis (2020) MZ: Estimate kinematics? Order of reaction? AF: Need kinetic model. Line fitting, minimize R squared. AY: Parameters can be assumed or from literature
4 – Discussion: improving on collaboration	AR: Current issues: meetings run over, Mustafa dealing with time zone issues & missed meetings. Informal structure for management. MJ: Task planner keeps track of everybody's work, need to keep track of everybody's work, avoid too technical discussion in the large group meeting MK: Jumping between roles YL: Actively take roles/assignments, speak up on jobs that each member feels comfortable with MN: Team has been helpful on dealing with time difference, by texting him what have been done (AR comment: MN so far productive with economics) HO: Sub-teams are good idea, communication between sub-teams can be improved SN: Schedule meetings more efficiently, length of meeting should be constraint, people should be able to go to lectures without pressure AR: Scheduled half-hour catch up meetings every day, accommodate MN's time better AF: Don't spend too much time on minutes. Can record meetings to save time. Can prepare slides for meetings. Speak between teams to learn from each other ST: Need extra effort in research (AR: write summary for literature) MZ: Catch-up and Planner has been helpful, meetings between sub-teams
5 – Finishing	AY: Address issues as soon as possible. Constantly check progress with each other **Next meeting: 12:00 Tuesday 2 February 2021.**

Actions

Description	Assignee	Due
Create availability grid & distribute to team	SN	26 Jan
Invite AF, AA to team Zotero library	AR	27 Jan
Read synthesis literature suggested by AF & AA	MJ, MZ	27 Jan
Patent review of process + BFD + PFD	MJ, YL	29 Jan
Synthesis route selection and kinetics derivation	MJ, MZ	29 Jan
Literature review of separation	MK, SN	29 Jan

Reactor type selection and basic modelling	AR, LZ, WO	3 Feb
Safety section of interim report	HO (ST)	5 Feb
Business section of interim report	MN, ST	5 Feb
Begin interim report		
- Create document template	AR	27 Jan
- Add in structure of items required	MJ	28 Jan
Draft list of “Team Norms” from collaboration discussion to work through at daily checkin	AR	26 Jan
Create structure for daily check-in meetings (PPT template?)	MJ	26 Jan

Approval

Dr Ali Yetisen *Facilitator*	Andreas Richardson *Chair*	Yuxin Liu *Secretary*

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Final Audit Report 2021-01-27

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