

**UNIVERSITI TEKNOLOGI MARA**

**PREPARATION,  
CHARACTERIZATION AND  
TURBIDITY REMOVAL OF KAOLIN  
SUSPENSION OF  
POLYACRYLAMIDE GRAFTED  
CHICKEN EGG WHITE**

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Thesis submitted in fulfillment  
of the requirements for the degree of  
**Master of Science**  
**(Applied Chemistry)**

**Faculty of Applied Sciences**

**April 2021**

## AUTHOR'S DECLARATION

I declare that the work in this thesis was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the results of my own work, unless otherwise indicated or acknowledged as referenced work. This thesis has not been submitted to any other academic institution or non-academic institution for any degree or qualification.

I, hereby, acknowledge that I have been supplied with the Academic Rules and Regulations for Post Graduate, Universiti Teknologi MARA, regulating the conduct of my study and research.

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## ABSTRACT

The polyacrylamide grafted chicken egg white (Egg-g-PAM) has been successfully synthesized by microwave-assisted graft copolymerization technique using ceric ammonium nitrate (CAN) as an initiator. This study aims to optimize the percentage of grafting efficiency (%GE) of Egg-g-PAM at various parameters (acrylamide (AM) weight, CAN weight and microwave irradiation time) and characterization by the percentage of water absorption (%WA), CHN elemental analysis, Fourier transform infrared (FTIR) spectroscopy, Field emission scanning electron microscopy-energy dispersive X-ray (FESEM-EDX) spectroscopy, thermogravimetric/derivative thermogravimetry (TG/DTG) and point of zero charge ( $\text{pH}_{\text{pzc}}$ ). Next, determination of the percentage of Turbidity Removal (%TR) on Egg-g-PAM, alum and egg white for coagulation/flocculation on a 0.25 g/L of kaolin suspension at pH 7 and 2 g/dL dosage. The optimum Egg-g-PAM was obtained by using 1 g of AM, 0.3 g of CAN and 2 min of irradiation time as it was able to obtain 52.1% of %GE, 185% of %WA and 95.6% of %TR. The %TR of optimum Egg-g-PAM (95.6%) was higher than that of alum (94.6%) and egg white (19.9%).

## **ACKNOWLEDGEMENT**

I would like to express my gratitude to many parties. Firstly, I wish to thank ALLAH S.W.T for giving me the opportunity to embark on my MSc and for completing these three years plus and challenging journey successfully. My gratitude and thanks go to my supervisor Dr Yong Soon Kong for his valuable guidance, constructive criticism, and encouragement during every stage of this project.

My appreciation goes to the Faculty of Applied Sciences and laboratory assistant for providing the facilities and assistance during the MSc journey. This study was funded by the Fundamental Research Grant Scheme (FRGS) 600-IRMI/FRGS 5/3 (024/2017) and is duly acknowledged. Special thanks to my colleagues (Aisyah, Fariha and Liyana) and my close friend (Roslinda, Nur Ilyani and Johann Emiir) for moral support and help with this project.

Finally, an honourable mention goes to my parents, Azuan bin Saat and Siti Rohani bt Mohd Noor for their financial and moral support. To my families and friends for their understanding and support in completing my MSc journey.

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