

**RECOVERY OF AU(III) AND AG(II) FROM
E-WASTE SOLUTION USING GREEN
ORGANIC SOLVENT THROUGH SOLVENT
EXTRACTION SYSTEM**

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**BACHELOR OF CHEMICAL ENGINEERING
(ENVIRONMENT) WITH HONOURS**

UNIVERSITI TEKNOLOGI MARA

2022

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SOLUTION USING GREEN ORGANIC SOLVENT
THROUGH SOLVENT EXTRACTION SYSTEM**

By

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This report is submitted in partial fulfillment of the requirements
needed for the award of
Bachelor of Chemical Engineering (Environment) with Honours

**CENTRE FOR CHEMICAL ENGINEERING STUDIES
UNIVERSITI TEKNOLOGI MARA**

AUG 2022

ACKNOWLEDGEMENT

First and foremost, praises and thanks to the God, the Almighty, for His showers of blessings throughout my research work to complete the research successfully. I would like to acknowledge and give my warmest thanks to my supervisor Dr Siti Fatimah Binti Abdul Halim who made this work possible. Her guidance and advice carried me through all the stages of writing my thesis. She has taught me the methodology to carry out the research and present the research works as clearly as possible.

Before I thank the following people, I would like to thank myself for surviving a life more like adventure or gambling. Here, I would say all the suffering to get this degree in chemical engineering will eventually become one part of my body but make me stronger. At the same time, I am extremely grateful to my parents for their love, prayers, care and sacrifices in educating and preparing for my future. Special thanks go to my friends, Arbaie and Ayu Najwa, for being with me since the first day of my degree life and helping me with this project.

Also, without my family and my friends unhesitating supporting, I was unable to overcome every obstacle I encountered. Once again, thank you so much for all the continued support through the good times and the bad. Alhamdulillah

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ABSTRACT

As the world undergoes rapid urbanization, the usage of natural resources growth has increased rapidly to a greater amount causing the rate of waste generation to increase align with it. On top of that, extracting gold and silver from wastes of electronic equipment (E-waste) is a sustainable strategy for the recovery of the previous metal, reducing environmental pollution, and addressing the growing demands for gold and silver resources. In this work, in order to recover precious metals such as Au(III) and Ag(II), solvent extraction system has been introduced as one of the technologies that can extract the precious metals from the E-waste solution. The past years, a serious environmental pollution and high energy consumption has been long-standing challenges in the gold and silver recovery industry because of using petroleum solvent as diluent and extractant that highly flammable and toxic. After considering this limitation, in this research using the application of green system solvent such as Palm Kernel Fatty Acid (PKFAD) and Jatropha Oil (JO) that used as a sole green organic solvent in the solvent extraction without addition of diluent and modifier. More than 90% of Au and 99% of Ag in PKFAD, whereas 97% of Au and 99% of Ag in JO was recovered through solvent extraction. Stripping can be performed using 0.5 M of thiourea and capable to strip 83 % of Au(III) and 70 % of Ag(II) in PKFAD, whereas in JO was obtained 71 % of Au(III) and 50 % of Ag(II) from loaded-organic phase. This research has also been conducted to identify the best pH equilibrium of aqueous solution on Au(III) and Ag(II) using different green organic solvent, and determine the effect of stripping agents towards the efficiency of the extraction. More importantly, this study has high values in recovery of Au(III) and Ag(II) while gives an environmental benefits.