

**SYNERGISTIC SEPARATION OF CO (II) AND  
NI (II) FROM AQUEOUS SOLUTIONS BY  
D2EHPA AND TBP DISSOLVED IN WASTE  
VEGETABLE OIL**

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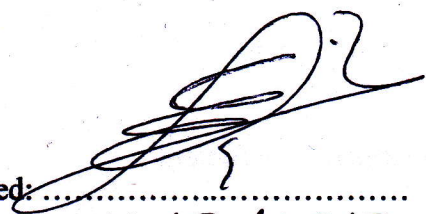
**UNIVERSITI TEKNOLOGI MARA**

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## **AUTHOR'S DECLARATION**

I declare that the work in the thesis was carried out in accordance with the regulation of Universiti Teknologi MARA. It is original and is the results of my own, unless otherwise indicated or acknowledge as reference work.

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

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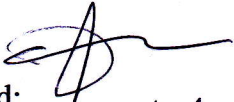
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We declared that we read this thesis and in our point of view this thesis is qualified in terms of scope and quality for the purpose of awarding the Bachelor of Chemical Engineering (Environment) with Honours.

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## ABSTRACT

The objective of the present work was to determine the effect of pH on the extraction of Co (II) and Ni (II) and to determine the effect of different ratio of concentration of D2EHPA and TBP on Co (II) and Ni (II) on the extraction. A solvent extraction process with the D2EHPA and TBP have been developed to extract cobalt and nickel in waste cooking oil as diluent. The process is environmentally friendly than traditional solvent extraction processes since no volatile and flammable diluent have to be used. The scope of the work were conducted in solvent extraction process method at varying pH (2.0–5.5) for the first parameter and ratio of concentration of D2EHPA to TBP (1:2, 2:1 and 3:1) for second parameter. Both parameters were constant the initial concentration of nitrate solution. The results of sample were be analyzed by determine the metal content in aqueous phase of cobalt and nickel by hydroxide precipitation method. It was found from the experiment that the optimum pH for the extraction of cobalt and nickel from aqueous nitrate solutions was a pH of 4.5 with the ratio concentration of D2EHPA to TBP 3:1 to give the highest degree of extraction with percentage extraction of cobalt (80%) and nickel (76.9%).