A STUDY OF THE EFFECT OF FERRIC CHLORIDE ($FeCl_3$) ETCHANT ON FERRITIC OR STEEL, WEIGHT LOSS AND SURFACE OF ZINC

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A study of the efect of ferric chloride (FeC1 3) etchant on depth of etch, weight loss and susrface of zinc / Nur Jumaira Abdul Jabar.

A STUDY OF THE EFFECT OF FERRIC CHLORIDE ($FeCl_3$) ETCHANT ON DEPTH OF ETCH, WEIGHT LOSS AND SURFACE OF ZINC

By

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A thesis submitted in partial fulfillment of requirement for the award of the degree of Bachelor of Applied Science (Physic, Electronic and Instrumentation)

DEPARTMENT OF PHYSICAL SCIENCES
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DECLARATION

I hereby declare that this thesis entitled A Study of The Effect of Ferric Chloride ($FeCl_3$) Etchant on Depth of Etch, Weight Loss and Surface of Zinc is the result of my own research excepts as cited in the references

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A STUDY OF THE EFFECT OF FERRIC CHLORIDE ($FeCl_3$) ETCHANT ON DEPTH OFE ETCH, WEIGHT LOSS AND SURFACE OF ZINC

ABSTRACT

Chemical etching is the controlled dissolution of material by contact with strong chemical solution. The process can be applied to any material. The process applies a strong chemical etchant solution to remove unwanted part in the material. It is basically a corrosion-controlled process. Etching is the art of engraving with acid on metal. In hard-ground etching the plate, usually of copper or zinc, is given a thin coating or ground of acid-resistant resin. This is sometimes smoked so that lines scratched through the resin will be clearly visible. Chemical etching process has a long history and accepted one of the important nontraditional machining processes during the last half century. The method is widely applied to machine geometrically complex parts from thin and flat of any material. It is also used to reduce weight of the materials. In this study, the chemical etching of zinc samples has been studied in Ferric Chloride ($FeCl_3$) etchant at different temperature and different concentration. This experiment was done at room temperature condition. The beneficial aspects of zinc samples were revealed from the experiments conducted. The depth of etch on the zinc samples were measured using outside micrometer. The surfaces of zinc sample before and after the experiment were characterized using Metallurgical Microscope. The plots of graphs obtained showed that the depth of etch was increased as the temperature increased. The depth of etch also increased as the concentration of $FeCl_3$ increased.

KAJIAN TERHADAP KESAN PENGGORES KIMIA FERUM KLORIDA ($FeCl_3$) KEPADA KEDALAMAN GORESAN, PENGURANGAN BERAT DAN PERMUKAAN ZINK

ABSTRAK

Goresan kimia adalah proses penyingkiran bahan yang tidak diperlukan dengan menggunakan larutan kimia. Proses ini boleh diaplikasikan pada semua bahan. Proses ini menggunakan penggores kimia yang kuat untuk membuang bahagian yang tidak digunakan dalam sesuatu bahan. Proses ini adalah asas kepada proses kawalan kakisan. Goresan adalah seni pengukiran menggunakan asid pada logam. Dalam goresan logam, selalunya kuprum dan zink, menghasilkan *thin coating* atau mendakan resin pengawal asid. Proses ini menghasilkan asap maka garisan tergores yang melalui resin dapat diperhatikan dengan jelas. Proses goresan kimia mempunyai sejarah dan diterima sebagai salah satu proses pembentukan secara bukan tradisional semasa separuh abad yang lepas. Kaedah ini selalu diaplikasikan untuk membentuk bahagian kompleks dari nipis dan rata pada logam secara geometrik. Ia juga digunakan untuk mengurangkan berat sesuatu bahan. Dalam kajian ini, goresan kimia pada sampel zink dikaji menggunakan penggores Ferum (III) klorida pada suhu dan kepekatan yang berlainan. Eksperimen ini dijalankan dalam keadaan suhu bilik. Aspek berfaedah yang ada pada sampel zink didedahkan dalam kajian ini. Kedalaman goresan pada sampel zink diukur menggunakan micrometer. Permukaan sampel zink sebelum dan selepas eksperimen digambarkan menggunakan *Metallurgical Microscope*. Graf yang diperolehi menunjukkan kedalaman goresan meningkat apabila suhu meningkat. Kedalaman goresan juga meningkat apabila kepekatan larutan $FeCl_3$ meningkat.