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**PEELABLE SOLDER MASK FROM
NATURAL RUBBER LATEX**

Mr. Pornchai Kengpanyadee

**A Thesis Submitted in Partial Fulfillment of the Requirements
for the Degree of Master of Science in Petrochemistry and Polymer Science**

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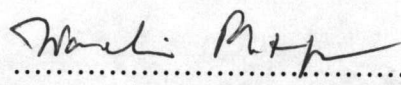
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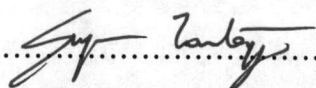
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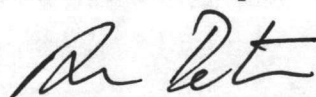
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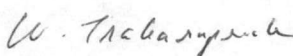

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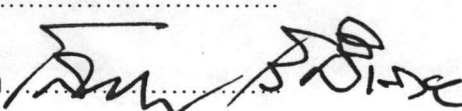
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งานวิจัยนี้เป็นการศึกษาองค์ประกอบและวิธีการเตรียมโสลดเคอร์มาสต์ชนิดลอกได้โดยใช้น้ำยางธรรมชาติ การเตรียมโสลดเคอร์ในงานวิจัยนี้ประกอบด้วย 2 ขั้นตอน คือ ขั้นตอนที่หนึ่ง การเตรียมน้ำยางคงรูปโดยการผสมน้ำยางขึ้นกับสารเคมีและให้ความร้อนที่ 70-80 องศาเซลเซียสเป็นเวลา 6 ชั่วโมง ขั้นตอนที่สอง การเตรียมโสลดเคอร์มาสต์ชนิดลอกได้โดยการนำน้ำยางคงรูปผสมกับสารช่วยปรับความหนืด (คาร์บอกซิเมทิลเซลลูโลส) ในงานวิจัยนี้สารที่ใช้เป็นสารในระบบการคงรูป ได้แก่ เตตระเมทิลไทยูเรม ไดซัลไฟด์, ซิงค์ออกไซด์, ซิงค์ไดบิวทิลไดโทโอคาร์บาเมต และไทโอยูเรีย เนื่องจากผลผลิตที่ได้จากสารในระบบคงรูปนี้จะมีสมบัติด้านความทนทานต่อความร้อนได้ดี

ในขั้นตอนการเตรียมน้ำยางคงรูป ได้ทำการศึกษาผลของความเข้มข้นขององค์ประกอบต่างๆ ได้แก่ เวลาความคงตัวต่อเครื่องมือกล, ความแข็งแรงต่อการดึงจนขาด, ความยาวที่ดึงจนขาด และความแข็ง นอกจากนี้ยังศึกษาสมบัติทางความร้อนและความหนืดของโสลดเคอร์มาสต์

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The present invention studied the composition and method for providing peelable solder mask based on natural rubber latex. The solder mask preparation consists of two step process. In the first step, prevulcanized latex was obtained by mixing concentrated latex with ingredients and heated at 70-80°C for 6 hours. In the second step, peelable solder mask was prepared by mixing the prevulcanized latex with thickener (carboxymethylcellulose). The vulcanizing system used were TMTD, ZnO, ZBDC and thiourea because the thiurum vulcanizate has the excellent heat resistance.

In the prevulcanized latex preparation, the effects of additive concentration on mechanical stability time (MST), tensile strength, elongation at break and hardness were investigated. Thermal property and viscosity of solder mask were determined.

สาขาวิชา.....ปิโตรเคมีและวิทยาศาสตร์พอลิเมอร์.....ลายมือชื่อนิสิต..... *Pondit Kengpadee*.....

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ABBREVIATIONS

PCB	:	Printed circuit board
UV	:	Ultraviolet
TMTD	:	Tetramethyl thiuram disulfide
ZnDTC	:	Zinc dithiocarbamate
ZBDC	:	Zinc dibutyl dithiocarbamate
TD	:	N,N'-Tetrasubstitued thiuram disulfides
ZnO	:	Zinc oxide
phr	:	Parts per hundred rubber
TGA	:	Thermogravimetric analyzer
cps	:	Centipoise
μm	:	Micrometer
MST	:	Mechanical stability time
N	:	Newton
CMC	:	Carboxymethyl cellulose
T_{onset}	:	Initial degradation temperature
T_{max}	:	Maximum degradation rate temperature