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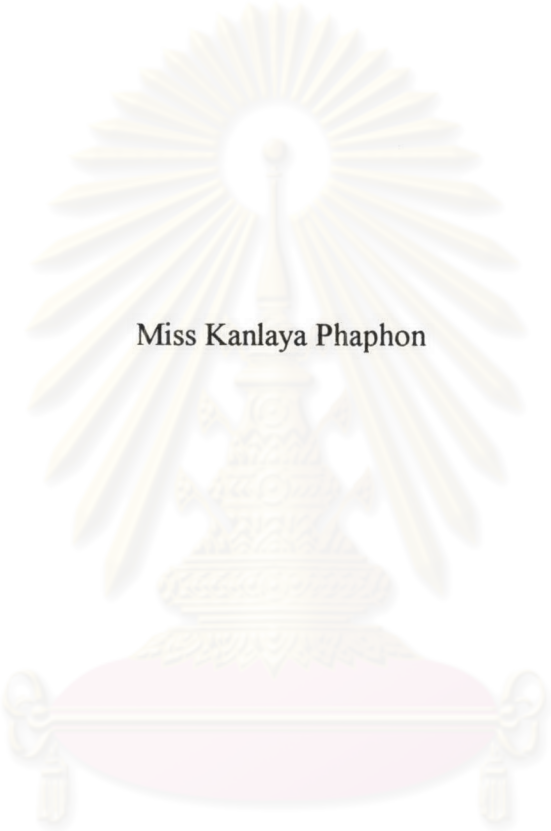
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DEVELOPMENT OF SOLDER PASTE FLUX



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จุฬาลงกรณ์มหาวิทยาลัย

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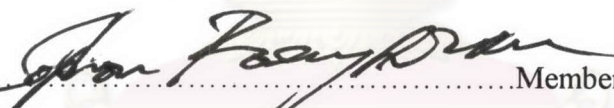
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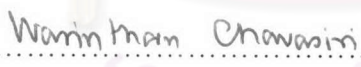
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ได้พัฒนาโซลเดอร์เพสต์ฟลักซ์เพื่อใช้ในการผลิตโซลเดอร์เพสต์เพื่อใช้ในกระบวนการ surface mounting technology ในอุตสาหกรรมอิเล็กทรอนิกส์โดยได้เลือกใช้ โคลิโพนี ชนิด KE604 ตัวทำละลายที่มีความเหมาะสมคือ diethylene glycol diethyl ether แอคติเวเทอร์ที่เลือกใช้คือ succinic acid และ สารที่ทำให้ชั้นที่ใช้คือ ozokerite และพบว่าความหนืดของโซลเดอร์เพสต์ฟลักซ์เพิ่มขึ้นเมื่อความเข้มข้นของตัวทำละลายลดลง และเมื่อมีการเพิ่มความเข้มข้นของ ozokerite พบว่าความหนืดเพิ่มขึ้นแต่สมบัติการละลายลดลง และสมบัติการหลุดตัวและการยึดติดดีขึ้นเมื่อความเข้มข้นของ ozokerite เพิ่มขึ้นและเมื่อความเข้มข้นของแอคติเวเทอร์เพิ่มขึ้น ค่าความต้านทานไฟฟ้ามีแนวโน้มลดลง แต่สมบัติการกัดกร่อนและสมบัติการทำให้เกิด wetting และ dewetting เพิ่มขึ้น

พบว่าโซลเดอร์เพสต์ฟลักซ์ที่ประกอบด้วย KE604 ในอัตราส่วน 61.8 เปอร์เซ็นต์โดยน้ำหนัก diethylene glycol diethyl ether ในอัตราส่วน 28.4 เปอร์เซ็นต์โดยน้ำหนัก succinic acid ในอัตราส่วนร้อยละ 2.9 เปอร์เซ็นต์โดยน้ำหนักและ ozokerite 6.9 เปอร์เซ็นต์โดยน้ำหนักคือสูตรที่ดีที่สุด และเมื่อทำการเปรียบเทียบสมบัติความหนืด ค่าความต้านทานไฟฟ้า การหลุดตัว การยึดติด การกัดกร่อนและสมบัติการทำให้เกิด wetting และ dewetting พบว่ามีคุณภาพทัดเทียมโซลเดอร์เพสต์ฟลักซ์ที่มีจำหน่ายในท้องตลาดและเมื่อจัดเก็บโซลเดอร์เพสต์ฟลักซ์ที่อุณหภูมิ 0-10 องศาเซลเซียส และ 11-35 องศาเซลเซียสเป็นเวลา 3 เดือนจากการทดลองพบว่าการจัดเก็บที่อุณหภูมิ 0-10 องศาเซลเซียสดีกว่าการจัดเก็บที่อุณหภูมิ 11-35 องศาเซลเซียส

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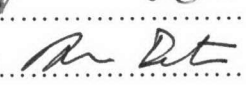
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Solder paste flux was developed for solder paste production to be used in the surface mounting technology in the electronic industries. In this study, the selected colophony was KE604, the solvent was diethylene glycol diethyl ether, the activator was succinic acid and thickening agent was ozokerite. It was found that total viscosity was increased when the solvent concentration decreased. The slump, viscosity and tackiness properties increased when the concentration of ozokerite increased. The electrical insulation resistance of solder paste flux decreased when the succinic acid concentration increased but the corrosion and the wetting and dewetting effect property increased.

It was found that the solder paste flux composed of 61.8 wt% KE604, 28.4 wt% diethylene glycol diethyl ether, 2.9 wt% succinic acid and 6.9 wt% ozokerite was the best formulation. It was comparable in terms of the viscosity, electrical insulation resistance, slump, tackiness, corrosion and wetting and dewetting effect properties to those of commercial available solder paste fluxes. When the solder paste flux was stored at 0-10 °C and 11-35 °C for 3 months, the result showed that the storage temperature at 0-10 °C was better than that at 11-35 °C.

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Field of study.....Petrochemistry and polymer science.....Student's signature.....
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List of Abbreviations (Continued)

γ_A	The interfacial tension between the basis metal and the flux.
γ_B	The interfacial tension between the basis metal and the molten solder.
γ_C	The interfacial tension between the flux and molten solder.
θ	Contact angle (dihedral angle) between the basis metal and the solder
PWB	Printed Wire Boards
Min	Minimum
STD	Standard
KOH	Potassium hydroxide
R	Rosin Type
RMA	Rosin Mildly Activated Type
RA	Rosin Activated Type
DEA. HCl	Diethylammonium chloride
ETA. HCl	Ethylammonium chloride
TEA. HCl	Triethylammonium chloride

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