

สื้ยอมทำเครื่องหมายจากคาร์ตานอลและอนุพันธ์แอนิสิ้น



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MARKER DYES FROM CARDANOL AND ANILINE DERIVATIVES

Miss Somsaluay Suwanprasop

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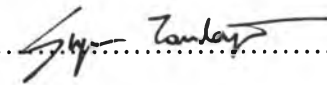
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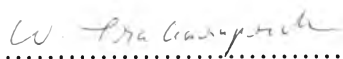
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สมสววย สุวรรณประสพ : สีย้อมทำเครื่องหมายจากคาร์ดานอลและอนุพันธ์แอนิลีน

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ได้เตรียมสีย้อมทำเครื่องหมายสำหรับผลิตภัณฑ์ปิโตรเลียมจากปฏิกิริยาคู่ควบระหว่างคาร์ดานอลที่ได้จากการทำให้บริสุทธิ์บางส่วนของสารสกัดเปลือกเมล็ดมะม่วงหิมพานต์ที่ผ่านการดีคาร์บอกซิเลตแล้ว กับสารประกอบเกลือไดอะโซเนียมของอนุพันธ์แอนิลีนที่มีหมู่แทนที่ต่างๆ กัน นำสีย้อมทำเครื่องหมายที่เตรียมได้ มาผสมในน้ำมันเบนซินและน้ำมันดีเซลหมุนเร็วที่ระดับความเข้มข้น 2 ถึง 5 ส่วนในล้านส่วน และสามารถตรวจวัดได้ด้วยการสกัดลงในชั้นของสารละลายต่างๆ ที่เหมาะสม จะเกิดสีที่เด่นชัดซึ่งสามารถนำมาวิเคราะห์หาปริมาณสีย้อมทำเครื่องหมายได้ด้วยเทคนิคทางอัลตราไวโอเลตและวิสิเบิลสเปกโตรโฟโตเมตรี จากการศึกษาสมบัติทางกายภาพด้วยวิธีการตาม ASTM ของน้ำมันเชื้อเพลิงที่เติมสีย้อมทำเครื่องหมายนี้ พบว่าสมบัติทางกายภาพของน้ำมันเชื้อเพลิงที่เติมสีย้อมทำเครื่องหมายนี้ไม่มีความแตกต่างจากน้ำมันเชื้อเพลิงที่ไม่เติมสีย้อมทำเครื่องหมาย นอกจากนี้ยังพบว่าสีย้อมทำเครื่องหมายนี้มีความคงตัวในน้ำมันเชื้อเพลิงในระยะเวลาไม่น้อยกว่า 3 เดือน จึงเหมาะสมที่จะใช้เป็นสารทำเครื่องหมายในน้ำมันเชื้อเพลิงได้

ภาควิชา.....

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Marker dyes for petroleum products were synthesized by coupling reaction of cardanol, which was obtained from partially purification of decarboxylated cashew nut shell liquid, with diazonium salts of aniline derivatives, whose structures possessing different substituents on the benzene ring. These synthetic marker dyes were added into gasoline and high-speed diesel at levels of 2 to 5 ppm, and their presence could be detected by extraction into an appropriate alkali aqueous solution, providing visual colors that could be quantitatively determined by UV/VIS spectrophotometry. The testing results using the ASTM test methods revealed that the physical properties of the dyed fuel oils were similar to those of the undyed fuel oils. Moreover, those synthetic marker dyes were found to be stable in fuel oils up to at least three months, suggesting that these marker dyes could be readily applied in the commercial fuel oils.

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LIST OF ABBREVIATIONS

ASTM	The American Society for Testing and Materials
Ave	Average
<i>br</i>	Broad
CNSL	Cashew nut shell liquid
δ	Chemical shift
cm^{-1}	Unit of wavenumber
cSt	CentiStroke
Corr	Corrected
$^{\circ}\text{C}$	Degree Celsius
<i>d</i>	Doublet
<i>dd</i>	Doublets of doublet
$^{\circ}\text{F}$	Degree Fahrenheit
FT-IR	Fourier-Transform infrared spectroscopy
Fig	Figure
<u>g</u>	Gram
Hz	Hertz
hr	Hour
IBP	Initial Boiling Point
<i>J</i>	Coupling constant
kPa	KiloPascal
l	Litre

<i>m</i>	Multiplet
nm	Nanometer
λ_{\max}	Maximum wavelength
NMR	Nuclear magnetic resonance spectroscopy
ppm	Parts per million
%wt	Percentage by weight
RON	Research Octane Number
<i>s</i>	Singlet
Temp.	Temperature
<i>t</i>	Triplet
UV/VIS	Ultraviolet/Visible spectrophotometry