

การแยกไขผลึกจุดภาค ไซพาราฟิน และน้ำมัน ออกจากไบอินเทอร์มีเดียต
โดยการสกัดลำดับส่วนด้วยตัวทำละลาย และการตกผลึกลำดับส่วน



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**SEPARATION OF MICROCRYSTALLINE WAX, PARAFFIN WAX AND OIL
FRACTIONS FROM INTERMEDIATE WAXES BY SOLVENT
FRACTIONATION EXTRACTION AND FRACTIONATION CRYSTALLIZATION**



Mr. Chakrapong Saengarun

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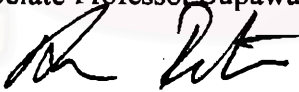
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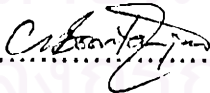
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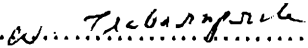
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จักรพงษ์ แสงอรุณ : การแยกไขผลึกจุลภาค ไขพาราฟิน และน้ำมัน ออกจากไขอินเทอร์มีเดียต โดยการสกัดลำดับส่วนด้วยตัวทำละลายและการตกผลึกลำดับส่วน (SEPARATION OF MICROCRYSTALLINE WAX, PARAFFIN WAX AND OIL FRACTIONS FROM INTERMEDIATE WAXES BY SOLVENT FRACTIONATION EXTRACTION AND FRACTIONATION CRYSTALLIZATION) อ. ที่ปรึกษา : รศ.ดร. อมร เพชรสม, อ. ที่ปรึกษาร่วม : ดร.จางรุงก์ บุญทันใจ, 179 หน้า. ISBN 974-334-945-6

การแยกไขผลึกจุลภาค ไขพาราฟินและน้ำมัน ออกจากไขอินเทอร์มีเดียตชนิด 500SW และ 600SW กระทำโดยใช้วิธีการสกัดลำดับส่วนด้วยตัวทำละลาย และวิธีการตกผลึกลำดับส่วน ได้ศึกษาถึงผลกระทบของอุณหภูมิและตัวทำละลาย (ได้แก่ เมทิลเอทิลคีโตน และโทลูอิน) ที่มีต่อการแยกลำดับส่วนของไขเหล่านี้ พบว่า เมทิลเอทิลคีโตน เหมาะสมกับงานนี้มากกว่าโทลูอิน การสกัดลำดับส่วนด้วย เมทิลเอทิลคีโตน กระทำจากอุณหภูมิ 20 ถึง 60 องศาเซลเซียส ไขพาราฟินซึ่งประกอบด้วยไฮโดรคาร์บอนชนิดโซ่ตรงในปริมาณมาก ถูกแยกได้ดี ณ. อุณหภูมิของการสกัดลำดับส่วนที่ 60 องศาเซลเซียส ไขผลึกจุลภาคซึ่งประกอบด้วยไฮโดรคาร์บอนชนิดโซ่แขนงในปริมาณมาก ถูกแยกได้ดีที่อุณหภูมิ 30, 40 และ 50 องศาเซลเซียส ส่วนในการตกผลึกลำดับส่วนโดยใช้ เมทิลเอทิลคีโตน กระทำที่อุณหภูมิ 10, 0, -10 และ -20 องศาเซลเซียส ทั้งไขผลึกจุลภาคที่ซึ่งถูกแยก ณ. อุณหภูมิ 10 และ 0 องศาเซลเซียส และน้ำมันที่ซึ่งถูกแยก ณ. อุณหภูมิ -10 และ -20 องศาเซลเซียส ทั้งคู่มีองค์ประกอบหลักเป็นไฮโดรคาร์บอนชนิดวง

ไขและน้ำมันที่ได้จากการแยกลำดับส่วนของไขชนิด 500SW และ 600SW ประกอบด้วย ไขพาราฟินชนิดโซ่ตรง ไขผลึกจุลภาคซึ่งประกอบด้วยไฮโดรคาร์บอนชนิดโซ่แขนง ไขผลึกจุลภาคซึ่งประกอบด้วยไฮโดรคาร์บอนชนิดวง และน้ำมันซึ่งประกอบด้วยไฮโดรคาร์บอนชนิดวง

สถาบันวิทยบริการ
จุฬาลงกรณ์มหาวิทยาลัย

สาขาวิชา.....ปีโคเคมีและวิทยาศาสตร์พอลิเมอร์.....

หลักสูตร.....ปีโคเคมีและวิทยาศาสตร์พอลิเมอร์.....

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ลายมือชื่อนิติ.....จักรพงษ์ แสงอรุณ.....

ลายมือชื่ออาจารย์ที่ปรึกษา.....อมร เพชรสม.....

ลายมือชื่ออาจารย์ที่ปรึกษาร่วม.....ดร.จางรุงก์ บุญทันใจ.....

4073406323 : MAJOR PETROCHEMISTRY AND POLYMER SCIENCE

KEY WORD : FRACTIONATION / PETROLEUM WAX / WAX DEOILING

CHAKRAPONG SAENGARUN : SEPARATION OF MICROCRYSTALLINE WAX, PARAFFIN WAX AND OIL FRACTIONS FROM INTERMEDIATE WAXES BY SOLVENT FRACTIONATION EXTRACTION AND FRACTIONATION CRYSTALLIZATION. THESIS ADVISOR : ASSOC. PROF. AMORN PETSOM, Ph.D. THESIS CO-ADVISOR : CHATURONG BOONTANJAI, Ph.D. 179 pp. ISBN 974-334-945-6

Separation of microcrystalline wax, paraffin wax and oil fractions from intermediate waxes, type 500SW and 600SW slack waxes, were performed by using solvent fractionation extraction and fractionation crystallization techniques. This investigation tried to study the effect of the temperature and solvent (MEK and toluene) on these slack-waxes fractionations. It was found that the MEK was more suitable for task than toluene. The MEK fractionation extractions were performed from temperatures of 20 to 60 °C. Paraffin waxes, which contain large amount of straight chain hydrocarbons, were preferentially separated at extracting temperature of 60 °C. Microcrystalline waxes, which contain large amount of branched-chain hydrocarbons, showed better separation at 30, 40 and 50 °C. The fractionation crystallization using MEK was performed at 10, 0, -10 and -20 °C. Both microcrystalline waxes, which were separated at 10 and 0 °C, and fractionated oils, which were separated at -10 and -20 °C, contain large amount of naphthenic hydrocarbons .

It was apparent that the fractionated waxes and oils, from fractionation of 500SW and 600SW slack waxes, contained normal paraffin waxes, microcrystalline waxes which contain branched-chain hydrocarbons, microcrystalline waxes which contain naphthenic hydrocarbons and oils which contain naphthenic hydrocarbons .

สาขาวิชา..... ปิโตรเคมีและวิทยาศาสตร์พอลิเมอร์.....

หลักสูตร..... ปิโตรเคมีและวิทยาศาสตร์พอลิเมอร์.....

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ABBREVIATIONS

A	=	Peak area count
ASTM	=	American Society for Testing and Materials
bbbl/ton-h	=	pound per ton-hour
bp	=	boiling point
CGA	=	Compressed Gas Association
%C _A	=	Percentage of aromatic ring structures
%C _N	=	Percentage of naphthene ring structures
%C _P	=	Percentage of paraffin chains
C no	=	Carbon Number
Column ID	=	Column Inside Diameter
cSt	=	Centistokes
FID	=	Flame Ionization Detector
g	=	gram
GC	=	Gas Chromatography
HT GC	=	High Temperature Gas Chromatography
Log	=	Logarithm
Lube Oil	=	Lubricant Oil
m	=	meter
mg	=	milligram
min	=	minute
ml	=	milliliter
mm	=	millimeter
MEK	=	Methyl Ethyl Ketone
MIBK	=	Methyl Isobutyl Ketone
Mic	=	Microcrystalline
mp	=	melting point
MW	=	Molecular Weight

ABBREVIATIONS (Continued)

- N** = Normal paraffin, a saturated hydrocarbon which has all carbon atoms bonded in a single length, without branching or hydrocarbon rings.
- NON** = Non-normal paraffin, all other hydrocarbon types excluding those hydrocarbons with carbon atoms in a single length. Includes aromatics, naphthenes, and branched hydrocarbon types.
- n-C₁₇** = normal paraffin of carbon number 17
- P/No** = Peak Number
- P/Na** = Peak Name
- ppm** = parts per million
- psi** = pound per square inches
- S** = Second
- Sep Temp** = Separating Temperature
- SG or Sp gr** = Specific Gravity
- Sim Dist** = Simulated Distillation
- T or Temp** = Temperature
- WCOT** = Wall Coated Open Tube
- wt %** = percentage by weight
- 150BS** = 150 Bright Stock
- 150BS SW** = 150 Bright Stock Slack Wax
- 150N** = 150 Neutral
- 60SW** = 60 Slack wax
- 150SW** = 150 Slack Wax
- 500SW** = 500 Slack Wax
- 600SW** = 600 Slack Wax

SYMBOLS

$^{\circ}\text{C}$	= Degree Celsius
CH_3COOH	= Acetic Acid
H_2	= Hydrogen gas
KI	= Potassium Iodide
mm^2	= square millimeter
N_2	= Nitrogen gas
NaN_3	= Sodium Azide
t_R	= Retention Time
t'_R	= Adjusted Retention Time
$\Delta t'_R$	= Different Adjusted Retention Time
ν	= Kinematic Viscosity
μg	= microgram
μm	= micrometer
$<$	= Lower than
Σ	= Summation

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