

**DYNAMIC SIMULATION ON DEPROPANIZER COLUMN
USING ADVANCED CONTROL SYSTEM**

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ABSTRACT

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Model predictive control (MPC) is widely used today in industrial plants. Dynamic matrix control (DMC), one kind of MPC, was applied to the dynamic simulation of depropanizer column by using Digital Visual Fortran programming language. The purpose of this research is to develop a dynamic model of a distillation column with advanced control system, like DMC and cascade control. The result of DMC was compared to the cascade control. The results of a two-point cascade control on temperature of depropanizer with disturbance of changes in feed composition, feed flow rate, and steam flow rate between DMC and cascade control were compared by using the integral absolute error (IAE). DMC gives lower IAE. Moreover, response curves of temperature with DMC give low oscillation and reach steady state faster than cascade control.

บทคัดย่อ

ฐานัฑรภมร สิริธนนัฑชัย: การลอกเลียนแบบจลนัฑศาสตรัฑการควบคุมโดยใช้ระบบควบคุมแบบจำลองการคาคการณ์ลัวงหน้า (Dynamic Simulation on Depropanizer Column using Advanced Control System) อ. ที่ปริศึกษา : ผศ.ดร. กิติพัฒน์ สีมานนัฑ และ ศ.ปีแอร้ โบโก้ 164 หน้า ISBN 974-9937-60-0

ระบบควบคุมแบบจำลองการคาคการณ์ลัวงหน้า (MPC) มีการใช้อย่างแพร่หลายในปัจจุบันในโรงงานอุตสาหกรรม ระบบควบคุมแบบไดนามิกส์ เมตริกส์ (DMC), ระบบควบคุมแบบจำลองการคาคการณ์ลัวงหน้าชนิดหนึ่ง, ถูกใช้ในระบบลอกเลียนแบบจลนัฑศาสตรัฑของหอกลันแอกโพรเพนโดยใช้โปรแกรมคอมพิวเตอร์ภาษา วิชวล ฟอรัแทรน วัตถุประสงค์ของการวิจัยนี้เพื่อพัฒนาแบบจำลองทางจลนัฑศาสตรัฑของระบบควบคุมหอกลันแอก, เช่น ระบบควบคุมแบบไดนามิกส์ เมตริกส์และระบบควบคุมแบบชันน้ำคค ผลลัพธ์ของระบบควบคุมแบบไดนามิกส์ เมตริกส์ถูกเปรียบเทียบกับระบบควบคุมแบบชันน้ำคค ผลลัพธ์ของระบบควบคุมแบบชันน้ำคคสองตำแหน่ง อุณหภูมิของหอกลันแอกโพรเพนจากการรบกวนระบบด้วยการเปลี่ยนองค์ประกอบในสายป้อน, อัตราการไหลเข้า, และอัตราการไหลของไอน้ำ ระหว่างระบบควบคุมแบบไดนามิกส์ เมตริกส์และระบบควบคุมแบบชันน้ำคค ถูกเปรียบเทียบโดยปฏิญานูพันธ์ของค่าสัมบูรณ์ของข้อผิดพลาด (IAE). ระบบควบคุมแบบไดนามิกส์ เมตริกส์ให้ค่าปฏิญานูพันธ์ของค่าสัมบูรณ์ของข้อผิดพลาดต่ำกว่าระบบควบคุมแบบชันน้ำคค นอกจากนี้, เส้นโค้งของการตอบสนองของอุณหภูมิจากระบบควบคุมแบบไดนามิกส์ เมตริกส์ให้การสั้นที่น้อยกว่าและถึงจุดคคงที่เร็วกว่าระบบควบคุมแบบชันน้ำคค

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