

## Accepted Manuscript

Title: Design, simulation and techno-economic analysis of two processes for the conversion of shale gas to ethylene

Authors: Andrea P. Ortiz-Espinoza, Mohamed M.B. Noureldin, Mahmoud M. El-Halwagi, Arturo Jiménez-Gutiérrez



PII: S0098-1354(17)30232-6  
DOI: <http://dx.doi.org/doi:10.1016/j.compchemeng.2017.05.023>  
Reference: CACE 5825

To appear in: *Computers and Chemical Engineering*

Received date: 22-8-2016  
Revised date: 19-5-2017  
Accepted date: 22-5-2017

Please cite this article as: Ortiz-Espinoza, Andrea P., Noureldin, Mohamed MB., El-Halwagi, Mahmoud M., & Jiménez-Gutiérrez, Arturo., Design, simulation and techno-economic analysis of two processes for the conversion of shale gas to ethylene. *Computers and Chemical Engineering* <http://dx.doi.org/10.1016/j.compchemeng.2017.05.023>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

# Design, simulation and techno-economic analysis of two processes for the conversion of shale gas to ethylene

Andrea P. Ortiz-Espinoza <sup>a</sup>, Mohamed M. B. Noureldin <sup>b</sup>, Mahmoud M. El-Halwagi <sup>b,c</sup>, Arturo Jiménez-Gutiérrez <sup>a\*</sup>

<sup>a</sup> Departamento de Ingeniería Química, Instituto Tecnológico de Celaya, Celaya, Gto. 38010, México

<sup>b</sup> Chemical Engineering Department, Texas A&M University, College Station, Texas 77843, U.S.

<sup>c</sup> Chemical and Materials Engineering Department, King Abdulaziz University, Jeddah, Saudi Arabia 21589

\*Corresponding author. Tel. +52-461-611-7575 Ext. 5577. E-mail: arturo@iqcelaya.itc.mx

## Highlights

- Shale gas has become an important energy source
- In addition to its use for energy, shale gas can be converted into value-added chemicals
- Ethylene is a major building block for valuable petrochemical products
- Two processes for the conversion of shale gas to ethylene are presented
- Techno-economic and environmental implications are discussed

## Abstract

Shale gas is being considered as feedstock for the production of major petrochemicals. One such chemical is ethylene. Although the typical production for ethylene is carried out via thermal cracking, alternative processes have been gaining importance recently. Among such alternatives are the Oxidative Coupling of Methane (OCM) and the Methanol to Olefins (MTO) processes. The first one is a direct conversion process while the second one involves several stages. The aim of this work is to carry out an economic, energy and environmental assessment for these two processes. The results show that the MTO process is more profitable under the economic and technical scenario considered here. A sensitivity analysis was conducted to show the shale gas and ethylene prices under which the OCM process would be economically attractive. An analysis on catalyst improvement needed for the OCM process to be profitable is also reported.

متن کامل مقاله

دریافت فوری ←

**ISI**Articles

مرجع مقالات تخصصی ایران

- ✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
- ✓ امکان دانلود نسخه ترجمه شده مقالات
- ✓ پذیرش سفارش ترجمه تخصصی
- ✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
- ✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
- ✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
- ✓ دانلود فوری مقاله پس از پرداخت آنلاین
- ✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات