



**Canadian Society for  
Chemical Engineering  
(CSChE) – Edmonton Section**

**American Institute of  
Chemical Engineers  
(AIChE) – Alberta Chapter**

## Understanding Natural Gas Hydrates

**June 29, 2006**

**University of Alberta, Edmonton, Alberta**



**Understanding Natural Gas Hydrates** – This 1 day course is a treatment of the important subject of natural gas hydrates. Hydrates are notorious in the natural gas business for causing process shutdowns, breaking equipment, and even causing death. Hydrates are also becoming a subject of serious discussion and research, as a potential future energy source. Included with the course fee is a textbook (\$130 value), written by the instructor that includes practical working examples, current reference data, and details of calculation methods.

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**Who Should Attend?** Engineers and scientists working in the petroleum industry. Senior operators will benefit from attending as well. To obtain full benefit, participants should have some knowledge of the background chemistry.

**Certificates of completion will be issued.** These can be used for professional development hours (8 PDHs).

**Class times.** Classes will run 8:30 am – 5:00 pm.

### **Workshop Topics:**

- The water molecule and the hydrogen bond
- Hydrate and non-hydrate formers
- Hydrate compositions
- Calculation of hydrate forming conditions
- Advanced calculation methods (software calculations)
- Methods for combating hydrate formation
- Physical properties of hydrates
- Water content of gas
- Use of phase diagrams to understand hydrate formation
- Natural occurrence of hydrates
- Hydrate Textbook (\$130 value)
- See more details at: <http://www.telusplanet.net/public/jcarroll/OUTLINE.HTM>

**June 29, 2006**

**U of A Campus,  
Room - ETL 1-008 in the Engineering Teaching  
and Learning Centre (ETL)**  
<http://www.campusmap.ualberta.ca>

**Fees:**  
**CSChE/AIChE/CIC members - \$400**  
**Non-Members - \$500**  
**Discount of 10% (multiple registrants)**  
**Students - \$250**

**Registration Form – [www.chemeng.ca/profdev](http://www.chemeng.ca/profdev)**

### **About the Course Leader:**

**John Carroll**, the instructor for this course and author of the manual, obtained his Ph.D. in Chemical Engineering in 1990 at the University of Alberta in Edmonton, Alberta. Until 1993, he was a Research Associate and Sessional Lecturer at the university, teaching heat transfer and numerical analysis. In addition he worked on several research projects relevant to the natural gas industry. He has authored or co-authored more than 30 papers in refereed journals, 10 articles in technical magazines, and approximately 25 conference presentations.

He is a registered professional engineer in Alberta and is associated with several chemical and engineering associations including the CSChE, and the Canadian Gas Processors Supply Association (CGPSA). He is also on the publications committee of the CSChE. Dr. Carroll is the Director, Geostorage Process Engineering at Gas Liquids Engineering in Calgary, Alberta. At GLE he has worked on a variety of projects, which included natural gas sweetening, hydrocarbon processing, acid gas injection, and fluid phase equilibrium. He is the instructor for several courses offered by Technical Training Services.

**Course Proceeds:** Course proceeds, after costs, are used to support Local CSChE and AIChE activities, CSChE Edmonton Section support to CSChE Chemical Engineering Student scholarships, and U of A ChESS club activities.

<sup>1</sup> Photos from Offshore Minerals Management, U.S. Dept of the Interior, [www.mms.gov](http://www.mms.gov) and National Institute of Standards and Technology, [www.nist.gov](http://www.nist.gov).

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## Registration Form

### Discount

Registration covers all program materials, refreshments during breaks and lunch but excludes accommodation. For organizations sending more than one participant, a 10% discount to the fee applies to the second and subsequent registrations.

### Cancellations

To cancel you must send your request in writing to our office.

Fifteen or more business days in advance: full refund less \$50 administration charge.

In case of unexpected event occurring after this time you may send someone else to take your place without any additional cost. The CSChE reserves the right to change the date or location of its events. The CSChE's responsibility will under no circumstances exceed the amount of the collected fee.

### Contact Information

#### Registration:

Michelle Moulton  
The Chemical Institute of Canada  
Toll-free 1-888-542-2242  
E-mail: [profdev@cheminst.ca](mailto:profdev@cheminst.ca)  
[www.cheminst.ca/profdev](http://www.cheminst.ca/profdev)

Mail or fax completed form with payment to:  
CSChE/Industrial Energy Management  
for Professional Development  
130 Slater Street, Suite 550,  
Ottawa, Ontario K1P 6E2  
Tel. (613) 232-6252  
Fax (613) 232-5862

#### Local Section/Technical Contact:

Bruce Peachey, P.Eng. MCIC  
CSChE Edmonton Section Treasurer  
C/o New Paradigm Engineering Ltd  
E-mail: [bruce@newparadigm.ab.ca](mailto:bruce@newparadigm.ab.ca)  
Tel: (780) 448-9195

Yes, register me now for:

- o **Understanding Natural Gas Hydrates**

**Please list additional names on separate copies made from this registration form.**

Name: \_\_\_\_\_

Position: \_\_\_\_\_

Company/organization: \_\_\_\_\_

Nature of business: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_ Prov: \_\_\_\_\_ Postal code: \_\_\_\_\_

Tel. (business) \_\_\_\_\_ (residence) \_\_\_\_\_

Please provide both business and residence telephone numbers in case of changes.

Fax: \_\_\_\_\_ E-mail: \_\_\_\_\_

### Tax information:

If you are tax-exempt, enter your tax-exempt number in the space below and attach a copy of your tax-exempt certificate.

Exempt no. \_\_\_\_\_

### Payment method

Payment must be received before course start date. Registration fees are \$400 for CSChE/AIChE/CIC members, \$500 for non-members, and \$250 for students, plus 7% GST.

Membership no.: \_\_\_\_\_ Organization: \_\_\_\_\_

Tuition (CDN funds) \$ \_\_\_\_\_

Plus 7% GST (GST no. 108076431) \$ \_\_\_\_\_

Total amount due \$ \_\_\_\_\_

Charge to:            MasterCard        VISA                    Amex

Card Number \_\_\_\_\_ Expiry date \_\_\_\_\_

Cardholder's Name \_\_\_\_\_

Authorized signature \_\_\_\_\_

Certified/company cheque or money order no. \_\_\_\_\_

Payable to The Chemical Institute of Canada