CYCLE DE CONFÉRENCES DE CHIMIE

Avec le concours de : Manufacture Française des Pneumatiques MICHELIN
Sigma Clermont
Institut de Chimie de Clermont-Ferrand (ICCF UMR 6296)
U.F.R. S.T. Département de Chimie

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Salle C

John CARROLL

Gas Liquids Engineering, Ltd.
Calgary, Canada

WHAT ARE GAS HYDRATES AND WHAT ARE THEY DOING IN MY PIPELINE?

Large quantities of natural gas are transported via pipelines. These include long distance transmissions lines, which can be transcontinental and even intercontinental; gathering systems for raw gas; interconnections within a processing facility, etc. In each of these cases it is important that the pipeline is not blocked with any material, particularly solids, that might affect the flow in the line. The most important of these solids are the gas hydrates. Hydrates are the most common cause of flow blockage in the natural gas industry.

Gas hydrates are ice-like solids that are formed by the combination of water and small molecules. The water molecules form hydrogen bonded cages, which are three-dimensional spheroid structures. Inside these cages resides a small molecule which stabilizes the structure causing a solid to precipitate.

Gas hydrates form at temperatures where a solid water phase would not otherwise be anticipated (i.e. above the freezing point of water). They are notorious for plugging wells and flow lines, damaging equipment, and improper handling has led to deaths.

In this presentation, we will discuss what hydrates are, under what conditions of pressure and temperature do they form and what are the common techniques for combatting their formation or removing the plugs once they have formed. The topic of hydrates is a rather complex one so this presentation will only provide a cursory overview of this subject.

Coordinatrices : Katia GUERIN, ☎ 33 473 407 567 courriel : katia.guerin@univ-bpclermont.fr
Pascale HUSSON ☎ 33 473 407 193 courriel : pascale.husson@univ-bpclermont.fr
Institut de Chimie de Clermont-Ferrand (ICCF-UMR 6296)
Université Blaise Pascal, 24, avenue des Landais, BP 80026 63171 AUBIERE cedex-France