

Abstracts Participantes

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Natural Gas as a valuable source for Downstream: integration with innovative technologies to reduce greenhouse emissions

Marta Bregua de la Sotilla y María Ángeles Romero Vázquez

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Abstract:

Natural Gas (NG) is a hydrocarbon-rich gas mixture whose main constituent is methane, but it can also contain higher hydrocarbons (ethane to hexane), nitrogen (N₂), carbon dioxide (CO₂), oxygen (O₂), hydrogen (H₂) and noble gases depending on the location where it is produced.

Due to the reduction of the cost of supply and the strong increase in the availability of gas globally, NG grows strongly in the energy mix. The International Energy Agency (IEA) affirms that NG demand is expected to increase in the upcoming years, becoming the second largest energy source after oil. This scenario is supported by developing economies which are increasing their levels of industrialization beside power demand in emerging countries and the continuing transition to a lower carbon fuel mix. The transition can be achieved by several alternatives such as decreasing methane emissions, promoting the use of CO₂, enhancing the use of low-carbon electricity and coupling refining processes with carbon capture.

NG as a feedstock in downstream has several applications to produce chemical products. Among others, methanol is becoming a very important compound for the current petrochemical market. Its industrial route is accomplished via two-step process which implies syngas (synthesis gas) production as an intermediate. Because of the high cost of the syngas production, much research has been developed in this field. Some of the most promising routes involve methane reforming processes or partial oxidations.

Concerning technologies, catalysis is playing a key role in terms of improving current process scheme. On the other hand, integration of different technologies has become crucial in order to enhance new promising technologies than can help to reduce greenhouse emissions and improve the energy efficiency.