

# ACID GAS DRYING

Natural Gas contains more and more significant amounts of H<sub>2</sub>S and CO<sub>2</sub>. Drying Natural Gas using standard molecular sieves (3A, 4A type) is practical only possible if the acid gas concentration is very low during regeneration.

LNG specifications after AGRU (Acid Gas Removal Unit) of 50 ppmV of CO<sub>2</sub>, and 4 ppmV of H<sub>2</sub>S meet classic molecular sieve requirements but when the scenario is different and there is more than those values, what is the right molecular sieves to choose from and what is the influence in the dehydration unit?

Thanks to CECA experience of more than 40 years as molecular sieves manufacturer, we are able to answer to your technical questions and to provide you the best solution regarding your specific needs.

Higher concentration of acid gas components, especially H<sub>2</sub>S will cause degradation of the molecular sieves, especially during the regeneration step, leading to dust formation and rapid loss of the adsorption capacity (see also our November Newsletter related to MolSieve contaminants). In this way, regeneration is the critical factor that decides the kind of molecular sieves to use.

Product selection will depend of content and type of acid compounds. At low levels of H<sub>2</sub>S and when no COS minimization is required, we recommend a standard 4A type MolSieve, otherwise we recommend a 3A type in order to avoid co-adsorption problems and to minimize CO<sub>2</sub> picks. When the H<sub>2</sub>S content is above 40 ppmV or the regeneration gas has more than 50%mol of CO<sub>2</sub> another kind of solution for acid gas is necessary.

**Siliporite RA** is special CECA molecular sieve designed to resist to acid gas attacks during regeneration, even when the gas contain up to 99% of CO<sub>2</sub>, for example for Carbon Captured Storage (CCS) cases.

Thanks to its special binder, **Siliporite RA** offers a longer lifetime service for the acid gas drying units. As discussed previously, regeneration step is a critical issue and **Siliporite RA** can be performed with a heating step at 250°C instead of 280°C as a normal 4A type Mol Sieves.

Of course the adsorption capacity will be different for each case and the molecular sieves quantity as well.

## Life time, mechanical and chemical resistance of Siliporite RA

Tests were conducted at our pilot plant of the R&D center to classify different adsorbents and to check their life time and behavior versus acid gas. The gas feed composition was H<sub>2</sub>S content > 2% Vol and significant CO<sub>2</sub> content (8-10% Vol). The different adsorbents was 3A molecular sieve (as reference), Silica Gel and **Siliporite RA**. The tests have concluded:

<b>3A molecular sieve</b>	Best initial adsorption capacity but formation of dust and loss of adsorption capacity. (Severe regeneration conditions)
<b>Silica Gel</b>	Low volume adsorption capacity but good aging behaviour.
<b>RA molecular sieve</b>	<i>Good adsorption capacity and good aging behavior.</i>



If you need more information or precisions about Acid Gas Drying, do not hesitate to contact one of our specialists.

Stay with us! Next issue will detail Marketing: missed a presentation? Conference?



Adsorption solution provider for drying and purification of gases or liquids  
Contact us for your process optimization - our specialists at your service  
[www.siliporite.com](http://www.siliporite.com), [siliporite@ceca.fr](mailto:siliporite@ceca.fr)