



**CCR Technologies Inc.**  
**Technical Bulletin**  
DGA Degradation and Reclamation

---

**DGA<sup>®</sup> (Diglycolamine<sup>®</sup>) Degradation**

When primary and secondary amines react with CO<sub>2</sub> and COS, they undergo some form of amine degradation. The advantage of the primary and secondary amines is that they are able to react with the CO<sub>2</sub> and the COS so well, with the slight disadvantage that some amine is “lost” through degradation. An advantage to the DGA<sup>®</sup> in your system is the fact that the CO<sub>2</sub> and COS degradation product bis-hydroxyethylethoxy urea (BHEEU), is reversible back to DGA<sup>®</sup> under the proper conditions so that no amine is lost due to this type of degradation.

When DGA<sup>®</sup> is subjected to very high temperatures (above 380 °F) over long periods of time, it has been found to degrade into morpholine. Please see “Saudi Arabian Experience with DGA<sup>®</sup> Units and Related Sulfur Plants” by Lewis G. Harruff (presented at the 1998 Laurence Reid Gas Conditioning Conference).

**DGA<sup>®</sup> Reclaiming Options**

Most DGA<sup>®</sup> facilities have their own slip-stream thermal reclaimer to ensure good solvent quality guidelines are met. However, over the life of the plant they may become undersized as capacity grows, may afford operational problems and expense, or may aggravate morpholine production.

Both ion-exchange or electro dialysis will remove HSS from the DGA<sup>®</sup> solution, but neither will be able to convert BHEEU back to DGA<sup>®</sup> and will not be able to remove any morpholine that may be in your system.

Vacuum distillation will be able to remove any HSS and morpholine from your solution, and will be able to convert the BHEEU back to useful DGA<sup>®</sup>. Another benefit to the vacuum distillation is the fact that solids and any heavy (higher boiling point) materials will also be removed from the solution. Solids and higher boiling point materials have been implicated in exacerbating foaming concerns in certain cases even though, with the exception of TSS, they are very hard to quantify on a standard amine analysis.

**CCR's Solution**

CCR's process is unique because it is the only one capable of removing virtually all the contaminants found in gas treatment chemicals (amines & glycols) in a single pass through the reclaiming unit without fouling or degrading the chemical. Innovative, mobile reclaiming units are mounted on specialized highway trailers. These units go to the customer's site and process the chemical (without shutting down the gas treating system) to solve operating problems attributable to chemical contamination. CCR technology can also be used to provide custom processing from a fixed location strategically placed in the marketplace. This fixed facility can provide complementary services to the customer along with chemical processing. Alternately, CCR technology can be designed into a module that is permanently installed at the client's facility.

**Summary**

When evaluating merchant reclaiming options remember that HSS are not the only issue, and may not even be the biggest issue. For more information contact CCR Technologies Inc. in Houston at 281-988-5800, or visit us at [www.reclaim.com](http://www.reclaim.com).