JM ProcessWise webinar

CAT-AID: Manage FCC metals, reduce delta coke (Q&A)

Q 01. You mentioned in the presentation that an ecat sample could be tested for Fe poisoning. How is that accomplished?

A 01. This can easily be done by providing an ecat sample to JM for testing. Our lab can analyze the sample under a scanning electron microscope and look for surface nodules which is a clear sign of iron poisoning. JM also recommends that you calculate the add-on iron; fresh catalyst iron content varies so you cannot look at just the ecat total Fe level.

Q 02. Would a catalyst need to be both V and Fe poisoned for CAT-AID™ to be effective?

A 02. No, CAT-AID can be used with high V levels and no Fe poisoning or with an Fe poisoned catalyst with moderate V levels. You would obviously need to be experiencing some negative impacts from one of the two poisons to make CAT-AID a good candidate for your unit. If you are experiencing both poisons, then CAT-AID would be a very strong candidate.

Q 03. I noticed that most of the users added CAT-AID at 10%. Is there a reason for that or could different percentages be used?

A 03. Our research has shown that 10% CAT-AID is an optimal starting point for additions. This provides a sufficient amount of CAT-AID to trap the available metals and allow for an evaluation of the additive benefits. Once this base operation with CAT-AID has been established, then adjustments, up or down, to the additive rate can be made. This is very common as refiners begin to feel comfortable with the improved

operation. For example, a refiner may reduce the base CAT-AID target level during a unit cutback or increase the level during a heavy feed run.

Q 04. **Does Cat-Aid perform any feed cracking reactions like the fresh catalyst?**

A 04. No, CAT-AID does not perform any cracking reactions. It works to trap V and Fe so that the base catalyst will perform the desired cracking reactions with minimal interference from these catalyst poisons.

Q 05. **How do I determine if CAT-AID would be a good fit for my unit?**

A 05. Please work with your JM sales or technical services representative. JM would initially gather some information on your FCC including ecat metals level and operational issues that might be related to metals poisoning. An ecat sample may be requested to confirm the level of metals poisoning. This information will be used to estimate the effectiveness of CAT-AID and develop various performance projections.

Q 06. **Do you have any experience of CAT-AID use in EMEA (Europe, Middle East, Africa) region and in partial burn units?**

A 06. Yes, JM has experience with CAT-AID in the EMEA region. We also have experience with all three of the standard combustion types (partial burn, full burn, two stage) using CAT-AID.

Q 07. **My catalyst already has a metals trap. Would adding CAT-AID give additional benefit?**

A 07. Yes, CAT-AID can provide additional benefits. We commonly see refiners make catalyst changes in an attempt to control metals. This typically includes increasing catalyst addition rate and/or using an integrated metals trap. With the separate particle approach, CAT-AID traps iron and vanadium away from the fresh catalyst particles while integrated methods deal with the catalyst poisons alongside the active sites. CAT-AID allows the feed to react cleanly on active sites without hindrance from iron poisoning or mobilized vanadium that is destroying zeolite. The base catalyst used in Example F in the presentation contained an integrated metals trap. CAT-AID was used with that fresh catalyst system and the benefits of CAT-AID were clearly seen.

Q 08. **How does CAT-AID improve LPG olefinicity?**

A 08. The glassy eutectic formed from iron poisoning inhibits feed hydrocarbons from entering the catalyst particle. This diffusion limitation also restricts cracked products from leaving the catalyst particle. The additional time hydrocarbons are in the catalyst pores results in more secondary reactions such as hydrogen transfer. Hence, some propylene and butylenes react to form propane and butanes. CAT-AID reduces these iron-rich surface nodules which allows feed hydrocarbons to enter and reacted products to exit more efficiently. This reduces the occurrence of the undesirable secondary reactions, thus, raising the LPG olefinicity.

We at JM would like to thank you for participating in this webinar.