
Question 26: What is your Best Practice for packing (material and shape) in isomerization unit off gas caustic scrubbers?

DUNHAM (UOP)

UOP recommends carbon Raschig rings. The key here is to specify to the vendor that this be used for caustic service so that the rings will be formed with the proper binder. If you get the wrong binder, the rings will dissolve. We have a similar service in HF alky units where we use carbon Raschig rings; and there, you have to make sure that the binder is resistant to acid. So, you cannot switch the two. I have seen the carbon Raschig rings ooze out of the tower when a customer bought the wrong binder.

Another material you can use is chemical-grade polypropylene. This is plastic, so it does have temperature limits. If you use this kind of material, you have to be careful not to steamout the tower because this packing is good for the operating temperature of the unit. But if you steam it out, it will melt, and all come out in one piece.

LAMBIE (KBC Advanced Technologies, Inc.)

My experience has only been with the carbon Raschig rings. I have not seen any issues with them in any other sites. My only other comment to add to Daryl's is that the use of ceramic rings is not recommended because they are not compatible with caustic.

DOMINIC VARRAVETO (Burns & McDonnell)

My question is related to the scrubber. Have there been any comments from the operators of these units with upsets that cause caustic to go backwards into the stabilizer and create plugging in the stabilizer overhead system?

LAMBIE (KBC Advanced Technologies, Inc.)

I have not seen or heard of this happening. Normally there is a check valve in the line to prevent any backflow from the caustic scrubber to the stabilizer.

RICK GRUBB (Chevron Products Company)

We have experienced caustic back-flowing in the overhead receiver drum, so we have installed quick-acting ball valves that activate pressure differential. When the pressure differential gets low enough, it will close the valve.

SCOTT LAMBIE (KBC Advanced Technologies, Inc.)

One-inch OD carbon Raschig rings have been the standard packing material for isomerization unit off gas caustic scrubbers. Use of this packing material has proven to be very effective in minimizing caustic breakthrough and water carryover. Operating the unit per the design circulation flow rates of caustic and water insures proper wetting of the packing material for maximum effectiveness.

The use of ceramic packing material should be avoided as caustic will attack and degrade the material.

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