

EEPC Conference 2020 – Abstract/Technical Paper

ABSTRACT

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Subject: Popcorn related fouling issues in Frac Train, and control measures

Over the recent years an increase in popcorn related fouling has been observed in the fractionation section of ethylene plants, a phenomena typically taking place in butadiene units only. Changing the cracker feedstocks to light (e.g. gas feeds), the presence of butadiene and peroxy-radicals are at the root cause of the problem. This affects the production reliability of the plant, inducing throughput limitations and EH&S risks related to the opening/cleaning of the equipment.

Popcorn type polymers are highly reactive and will act as seeds for further polymer popcorn growth, therefore it is vital to avoid the popcorn polymer formation through an antifoulant treatment program which is effective towards the inhibition of peroxy free radicals and supported by a proper monitoring program to optimize the application in terms of performance.

From an analytical perspective the antifoulant treatment is supported through the measurement of free peroxides and the residual content of active inhibitor components in the bottom section of the related columns which enables an improved reactive approach in controlling the antifoulant dosage at a proper level. Plant tests at Dow Terneuzen clearly show a correlation between residual inhibitor components and free peroxides in the bottom of a depropanizer.