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Call for Papers

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Title:

Methanol emission from ammonia plants and its reduction

Abstract:

The CO₂ which is removed from the synthesis gas in an ammonia plant is released to the ambient air if it is not used by another process. This CO₂ stream typically contains a considerable amount of methanol. Methanol like other volatile organic compounds (VOC) is contributing to the formation of photochemical smog, which consists mostly of ozone (O₃). Since ozone adversely affects human health, there are ozone limits set in many places of the world. Consequently, limits have been put in place in recent time in many places (e.g. in the USA) for the emission of its precursors.

This becomes a challenge for ammonia producers. Methanol is generated as an unwanted by-product in the CO shift. Part of it is removed from the process gas with the process condensate. The major part of the rest is removed in the CO₂ removal unit and is ending up in the CO₂ stream.

The paper briefly describes the effect of methanol in the atmosphere and the process of methanol formation in the process. It focuses on ways to reduce its emission by measures at the source (e.g. by selection of suitable LT shift catalyst), and downstream in the process, e.g. around the CO₂ removal unit, and at "end of pipe" at the emission point (e.g. by removal by catalytic oxidation).