

## T-N Removal of Acrylonitrile Wastewater by Supercritical Water Oxidation

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The removal of T-N (total nitrogen) from wastewater is important because total nitrogen in water causes eutrophication which can have a negative influence upon the stability of an ecosystem. For this reason, many countries regulate the amount of nitrogen (organic-nitrogen, ammonia, nitrate and nitrite) in discharged streams. Acrylonitrile wastewater from acrylonitrile manufacturing plant has mainly been treated with microbial degradation, despite the fact that it is difficult to biodegrade. To decrease the amount of nitrogen in acrylonitrile wastewater, experiments were carried out at temperatures from 350 to 550 °C and a fixed pressure of 250 bar. The residence time ranged from 3 to 15 s, and the initial T-N of acrylonitrile solution was set 11,995 mg/l. 31.71 wt% H<sub>2</sub>O<sub>2</sub> solution was used as an oxidant and the stoichiometric ratios of O<sub>2</sub> based on initial TOC ranged from 0.5 to 2.5. As a result, T-N of acrylonitrile wastewater was reduced by 45% within 15 s at temperature of 550 °C. To increase T-N removal, ammonia and urea were used as additives which play a key role to reduce T-N of acrylonitrile wastewater.