



Amine Odor Control

Application Description:

Amines, which are formed by the meat packing industry, have a disagreeable odor, can cause nausea, and have a very high chlorine demand. They must be removed from process water prior to discharge.

Amines are the organic analog of ammonia (NH_3). Replacing a hydrogen (H) with an alkyl group (R) forms a primary amine (RNH_2); replacing two hydrogens forms a secondary amine (R_2NH); replacing three hydrogens forms a tertiary amine (R_3N). Substituting alkyl groups for hydrogen atoms increases the objectionable odor of the amine.

The reactivity of chlorine dioxide towards amines increases with the degree (amount) of substitution and pH. Chlorine dioxide does not react with ammonia and primary amines. At pH's above 7, 5 parts (by weight) of chlorine dioxide oxidizes 1 part of secondary amine. At pH's between 5 and 9, 10 parts of chlorine dioxide oxidizes 1 part of tertiary amine.

In contrast, chlorine reacts more preferentially with ammonia than with amines. Consequently, chlorine is not cost-effective in removing these foul-smelling secondary and tertiary amines.

Alternatives:

- Perfumes or odor-masking chemicals can be used but can only hide the odor.

Advantages of Sodium Chlorite/Chlorine Dioxide:

- Chlorine dioxide is the only effective means known to destroy the amines responsible for the source of these odors.

Affected Industries:

Food Processing (Meat Packing)

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