



To: Robert Miller Top Product Innovations

From John Newport Chemventive LLC

May 29, 2020

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In response to your Customer inquiry

Can we get a written opinion on ionization and reactions to air contaminants at a water park? The potential customer wants confirmation that ions won't create anything harmful out of chlorine created stuff like chloramines.

As noted in Wikipedia (en.wikipedia.org/wiki/Chloramines) " Chloramines also refers to any chloramine formed by chlorine reacting with ammonia introduced into swimming pools by human perspiration, saliva, mucus, urine, and other biologic substances, and by insects and other pests.[6] Chloramines are responsible for the "chlorine smell" of pools, as well as skin and eye irritation. These problems are the result of insufficient levels of free available chlorine, and indicate a pool that must be "shocked" by the addition of 5-10 times the normal amount of chlorine.[7]" .To generate chloramines you need a source of ammonia or amine compounds and chlorine. While there may be some chlorine in the atmosphere over the pool our process does not generate any amine compounds so there is no danger of us producing any additional atmospheric chloramines.

With regard to interactions of airborne chloramines with air ions I don't have any first hand knowledge. However, based on the fact that chloramines are destroyed by hydrogen peroxide (pubmed.ncbi.nlm.nih.gov/23601896/) my expectation is similar reactions can occur here so I don't anticipate anything more harmful than chloramines themselves being produced. Likely products will be water, chlorine or oxychlorine compounds and nitrogen or nitric oxides.

