

Safer Disinfectant Use in Schools During the COVID-19 Pandemic

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Why worry about Cleaning and Disinfecting Products?

- Those who do cleaning work have highest rates of work-related asthma^{1,2}
- Increased risk of asthma in anyone whose job involves cleaning product exposure, especially those preparing disinfectants³
- People who clean their own homes have higher rates of lower respiratory symptoms if they use bleach or multiple kinds of sprays^{4,5}
- Children whose homes have higher VOCs are more likely to have asthma⁶
- Increased risk of subclinical airways inflammation with increased cleaning spray use in the home⁷
- Children exposed to more cleaning products in infancy are more likely to wheeze when they're older⁸

¹Reinisch et al 2001, ²Dumas 2019, ³Gonzalez et al 2014, ⁴Zock et al 2009, ⁵Bedard et al 2014, ⁶Mendell 2007, ⁷Casas et al 2013, ⁸Parks et al 2020

Bleach (Sodium hypochlorite)

- Most common disinfectant used
- Mechanism thought to be by protein aggregation
- Dwell time usually 5-10 min
- Large acute exposures clearly cause respiratory effects
- Chronic low-level bleach exposure associated with asthma in animal studies and custodial workers^{1,2}
- Designated asthmagen
- Responsible for 62% of the increase in poison center calls³



Quaternary Ammonium Compounds (QACs)

- Cationic detergents
- Disinfect via multiple routes:
 - disruption of cellular membranes
 - possible intracellular effects
- Usual dwell times: 4-10 minutes
- Ammonia released during cleaning
- Known asthmagens, higher odds ratio after exposure than bleach
- Evidence of mutagenicity and possible reproductive toxicity in animal studies¹
- Chloramine gas released if mixed with bleach, see
 https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprd3793292.pdf





Advocating for Safer Products

Safer Cleaning Products







EPA's Design for the Environment Antimicrobial Pilot Project

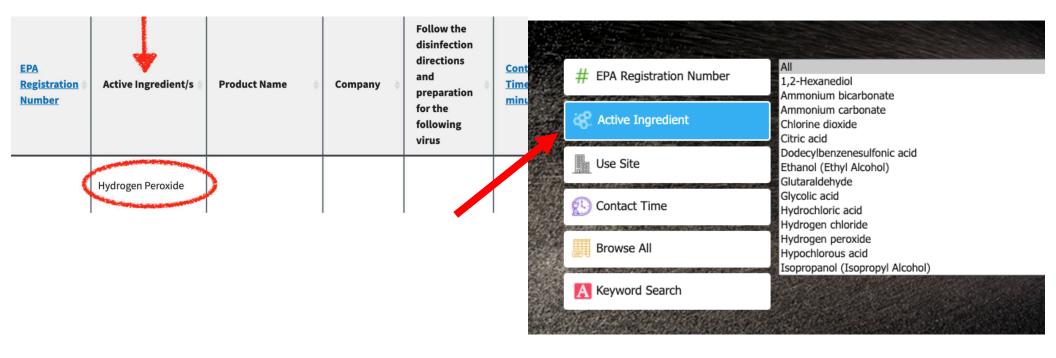
Active Ingredients	Year Approved
Citric acid	2009
Hydrogen peroxide	2009
L-lactic acid	2009
<u>Ethanol</u>	2012
Isopropanol	2012
Peroxyacetic acid	2015
Sodium Bisulfate	2015



Look for DfE Products on the N list



List N Tool: COVID-19 Disinfectants



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