

A DEEP DIVE INTO HARMFUL CLEANING PRODUCTS

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Triclosan

Turning the Tide. (2015). *Rodale's Organic Life*, 1(3), 28–29.

- Found in most cleaning products labelled as “antibacterial”
- Contributes to antibiotic/antimicrobial resistance and modifies the microbiome

1,4-Dioxane

Zhao, L., Hou, H., Fujii, A., Hosomi, M., & Li, F. (2014). Degradation of 1,4-dioxane in water with heat- and Fe-activated persulfate oxidation. *Environmental Science & Pollution Research*, 21(12), 7457.

- Found in most cleaning products labelled as “antibacterial”
- Though it does not bioaccumulate, it does not readily biodegrade in water or soil.

Nonylphenol Ethoxylates (NPEs)

Hu, X., Sun, Z., Wang, J., An, M., & Duan, S. (2014). Sublethal Toxic Effects of Nonylphenol Ethoxylate and Nonylphenol to *Moina macrocopa*. *Bulletin of Environmental Contamination & Toxicology*, 93(2), 204.

- Found as a surfactant in cleaning products (used to loosen the dirt and grease)
- Damages fishes’ gills and destroys the protective mucus layer on their skins.

Phosphates

Alyamani, E.J., Booq, R.Y., Bahkali, A.H., & Alharbi, S.A. (2020). Biological Removal of Nitrates from Groundwater Resources in Saudi Arabia. *Journal of Pure & Applied Microbiology*, 14(3), 2203.

- Found as a detergent in floor cleaners and other household cleaning products
- Wastewater treatment only filters ~30% of phosphates; the rest enters waterways.

Phthalates

Vannucchi, F., Francini, A., Pierattini, E. C., Raffaelli, A., & Sebastiani, L. (2019). *Populus alba* dioctyl phthalate uptake from contaminated water. *Environmental Science & Pollution Research*, 26(25), 25564.

- Most common in air fresheners, but also in cleaning and laundry products
- Most fragrances contain phthalates, which do not have to be disclosed in lists of ingredients because fragrances are protected by trade secret law.
- Toxic to aquatic organisms (bacteria, algae, crustaceans, insects, and fish).

Quaternary Ammonium Compounds Cleaning Products (QUATs or QACs)

Wanja, D.W., Mbuthia, P.G., Waruiru, R.M., Bebor, L.C., Ngowi, H.A., & Nyaga, P.N. (2020). Antibiotic and Disinfectant Susceptibility Patterns of Bacteria Isolated from Farmed Fish in Kirinyaga County, Kenya. *International Journal of Microbiology*, 1.

- Used as disinfectants, surfactants, and fabric softeners.
- Toxic to many aquatic organisms, and does not degrade.

Volatile Organic Compounds Cleaning Products (VOCs)

Afshar, A., Feizi, F., Moghadam, A., & Saadatpour, M. (2017). Enhanced CE-QUAL-W2 model to predict the fate and transport of volatile organic compounds in water body: Gheshlagh reservoir as case study. *Environmental Earth Sciences*, 76(23), 1.

- Found in many cleaning products of all kinds
- Cause excess algae growth, resulting in loss of daylight for aquatic ecosystems, and depletion of oxygen levels, which kills fish and other animals. They can poison drinking water or lakes for swimming.