

Ozone breaks down THC deposited on surfaces from thirdhand cannabis smoke

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Second- and thirdhand tobacco smoke have received lots of attention,

but much less is known about the compounds deposited on surfaces from cannabis smoke. Now, researchers reporting in ACS' *Environmental Science & Technology* have discovered that ozone—a component of outdoor and indoor air—can react with tetrahydrocannabinol (THC), the psychoactive component of cannabis, on glass or cotton surfaces to produce new compounds, which they characterized for the first time.

Smoking emits reactive chemicals that remain in the air (so-called secondhand smoke) or deposit onto surfaces, including walls, windows, clothing and upholstery (thirdhand smoke). Unlike the secondhand variety, thirdhand smoke lingers long after a person stops smoking. Nicotine is semi-volatile and reacts with other chemicals on surfaces, producing new [compounds](#) that, if volatile, can also become airborne. Because [cannabis smoke](#) is chemically distinct from [tobacco smoke](#), Aaron Wylie and Jonathan Abbatt wanted to characterize the compounds formed when THC, by itself or in cannabis smoke, on surfaces reacts with ozone in the air.

The researchers coated glass and cotton cloth, to simulate windows and clothing, with a THC solution. Then, they exposed the surfaces to concentrations of ozone that could exist in [indoor air](#). In their analysis, they found that over time, the amount of THC on glass and cotton decreased, while the quantities of three THC oxidation products increased. In other experiments, the team used a smoking machine to deposit cannabis smoke onto cotton. Upon exposure to ozone, the same three compounds formed at roughly the same rate as observed for the THC-coated cloth. Because of the low volatility of THC and its oxidation products, the compounds are unlikely to be emitted to the air where they could be inhaled in as large amounts as nicotine, the researchers say. They say that somebody could still be exposed to THC and its derivatives, whose [health effects](#) are unknown, if they, for example, lick their fingers after touching a surface contaminated by cannabis smoke.

More information: Aaron D. L. Wylie et al. Heterogeneous Ozonolysis of Tetrahydrocannabinol: Implications for Thirdhand Cannabis Smoke, *Environmental Science & Technology* (2020). [DOI: 10.1021/acs.est.0c03728](https://doi.org/10.1021/acs.est.0c03728)

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