

Toxic chemicals calling: Cell phones as a source of flame retardants

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Cell phones—much has been written about their detrimental effects on attention spans, stress levels and dinner table conversations. People are in constant contact with their cell phones at all hours of the day. New research from the University of Toronto (U of T) suggests they could also be a source of toxic chemicals, or at least an indicator of the chemicals to which people are exposed.

In a study published today in *Environment International*, scientists from U of T found that levels of several toxic chemicals on the cell phones of Canadian women aged 18-44 were related to levels of those chemicals in their bodies and on their hands. It is the first study to identify handheld electronic devices as a potential source of exposure to organophosphate esters, chemicals often used either as flame retardants or plasticizers that make materials such as polyvinyl chloride more flexible and durable.

"We are concerned with these chemicals as they have been linked to neurotoxicity, decreased fertility and thyroid problems," says Miriam Diamond, a professor in the Department of Earth Sciences in the Faculty of Arts & Science at U of T and lead author of the study. "What we don't know for certain though is whether electronic devices are the source of the chemicals or an indicator of total exposure from other sources, or both."

The researchers found correlations between levels of organophosphate esters on [electronic devices](#) and levels on hands and in urine. Further, they found that levels of the [flame retardants](#) and plasticizers were higher on [handheld devices](#) such as cell phones and tablets, than non-handheld electronics such as televisions and desktop computers.

As such, handheld devices like cell phones may be sources of some of these compounds, but also may serve as time-integrated samplers, providing an indication of [chemical](#) exposure across the different environments where people spend time each day—for example, their homes, cars and workplaces.

These new findings come amidst calls for increased focus on the environmental and human health impacts of electronics. Existing electronics industry standards cover thermal, electrical, optical and even acoustic product safety, but do not specify how materials should be screened for possible toxicological impacts.

"Earlier this year the U.S. Consumer Product Safety Commission granted a petition to ban the use of certain harmful flame retardant chemicals in electronics and other products," says Diamond. "The organophosphate esters identified in this new study are often used as replacements for the banned chemicals, and increasing evidence indicates that these replacement chemicals are harmful as well."

Diamond says that given the ubiquity of these devices that are in so many people's hands all the time, from kids to adults, "periodically wiping down your [cell phone](#) should lower the levels of these toxic chemicals on the [device](#) and hence on your hands. She also adds that "we need to be aware of—and try to reduce—how much we use our handheld devices, especially by kids."

More information: Congqiao Yang et al, Are cell phones an indicator of personal exposure to organophosphate flame retardants and plasticizers?, *Environment International* (2018). [DOI: 10.1016/j.envint.2018.10.021](#)

Provided by University of Toronto

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