

Could washing our clothes with detergent become a thing of the past?

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Credit: Pixabay/CC0 Public Domain

Could washing our clothes with detergent become a thing of the past? Even though the research is in its early stages, an investigation as to whether washing or cleaning can be done with purified water instead of

detergent solution looks promising.

"Our goal is to develop a scientific model that explains what happens both chemically and physically when dirt is removed in purified water. When it comes to washing with detergents we already know what happens, but this is an unexplored area," says Andriani Tsompou, Ph.D. candidate at Malmö University.

Professor Vitaly Kocherbitov adds, "In the long run, our research can solve [environmental problems](#) with [water pollution](#) caused by detergents. To succeed in this, we need to better understand the [intermolecular forces](#) that act in purified water."

The hypothesis is that in purified water—water that has been filtered and deionised so that impurities and especially ions are removed—repulsive forces between charged objects become stronger. As a result, dirt particles easier detach from surfaces and form a finely dispersed colloidal system in water.

Tsompou explains, "When you have salt in the system, the dirt you want to remove will clump together more and make it harder for the water to remove the particles from the material."

According to [earlier results of a study](#) published in the *Journal of Colloid and Interface Science*, Tsompou and her colleagues used water with different properties: tap water, water with added salt, and two grades of purified water. In a QCM-D measurement—a surface-sensitive real-time technique for analyzing surface interaction and layer properties in thin films—a 90% purification of Vaseline on a glass slide was achieved for both grades of purified water at 25-degrees.

In later trials, they have been experimenting with several washing cycles and with different temperatures and achieved a degree of purification of

100% in purified water at 40 degrees in two washing cycles.

In these trials, however, the most favorable conditions have been assumed by choosing surfaces and dirt that form weak bonds. "We have used [water](#)-friendly surfaces such as glass and silicate which have a [negative charges](#) and then [olive oil](#) or Vaseline, which also can get negative charges, so that they release each other easily, explains Tsompou.

The idea is to gradually increase the bond strength and change the materials so that they finally approach real conditions.

"Because these are such complicated processes, we have to build up knowledge from less complicated areas. The next step will be oil on plastic which stronger attach to each other. The end goal is of course to test on real fabric," says Tsompou.

Provided by Malmö University

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