CHEMISTRY

When Art Falls Apart

As plastic used in modern art degrades, scientists turn to nanotechnology to put it back together

By Josh Fischman on April 1, 2016

Credit: © Nanorestart

[Editor's note: A reference to acrylics in the first paragraph has been removed on March 18, 2016, to avoid implying that acrylic artist paints will be unsuitable for

display in one hundred years.]

Conservators at museums and art galleries have a big worry. They believe there is a good chance the art they showcase now will not be fit to be seen in one hundred years, according to researchers in a project called Nanorestart. Why? After 1940, artists began using plastic-based material that was a far cry from the oil-based paints used by classical painters. Plastic is also far more fragile, it turns out. Its chemical bonds readily break. And they cannot be restored using techniques historically relied upon by conservators.

So art conservation scientists have turned to nanotechnology for help. In the Nanorestart project (the idea is to use nanomatierials to restore art) a consortium of 27 museums, universities, and chemical companies—financially supported by the European Union—began to tackle four tasks in 2015. The first goal is cleaning contemporary art surfaces. Second is stabilizing canvases and painted layers. Third is removing unwanted modern materials. And fourth is figuring ways to enhance protection of the artworks. With novel materials that function at the nanoscale, workers hope to penetrate the polymer networks that underlie artworks, remove the blemishes of degradation, and stabilize the remaining structures.

A related project called Popart (Preservation of Plastic Artefacts in museum collections) developed spectroscopic and chromatographic analytic techniques for identifying the plastic components in the art, the first steps towards preserving them. The researchers also tracked the ways in which those plastics degrade, an important step because degradation byproducts--gases, for example-- can also damage nearby objects in display cases. Cleaning these objects without harming them was also a major focus. You can watch videos of scientists explaining the various cleaning techniques here.