

Technology

Old milk provides a whey to extract gold from e-waste

AN AEROGEL made from old milk can extract gold nuggets from old computer motherboards.

Discarded electronics, known as e-waste, often contain gold and other heavy metals. There are methods to recover the valuable metals, but these processes often rely on synthetic chemicals that can damage the environment.

Now, Raffaele Mezzenga at ETH Zurich in Switzerland and his colleagues have found a way to recover gold from e-waste by using

a milk-derived aerogel, a type of gel where the liquid component is replaced with gas. "If you do an economic calculation, the margin is quite high because we start from a material [e-waste] which has no cost, and we start from a material [whey] which is very easy to process," says Mezzenga.

Mezzenga and his team took discarded whey, a by-product of strained milk, and extracted long, nanoscopically thin protein fibres. They then added an acid to link the fibres, froze them and heated the resulting mass to form an aerogel.

Next, they placed the aerogel in a soup of computer motherboards, which they had stripped of all



RAFFAELE MEZZENGA

A gold nugget obtained by processing melted-down old computer motherboards

with most of the remainder of each nugget being copper (*Advanced Materials*, doi.org/mf6m).

Using one waste product to extract valuable material from another is sustainable, but as the aerogel also absorbs other metals, it makes the gold less widely usable, says Jason Love at the University of Edinburgh, UK. He adds that people shouldn't try the method at home because dissolving motherboards in acid is dangerous and can give off toxic fumes. ■ Alex Wilkins