

# Research conducted to obtain glass-ceramic materials from abandoned mine waste

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Research shows that abandoned mine waste can be transformed into glass-ceramic materials, and at a cheaper cost compared to traditional composite materials. This waste, located in open-air tanks, could be used to cover facades or as flooring for areas with high usage levels, such as supermarkets.

Professor in Soil Science and Agricultural Chemistry of the Miguel Hernández University of Elche (UMH), Manuel Jordán Vidal, is taking part in research that has shown that abandoned mine [waste](#) can be transformed into glass-ceramic [materials](#), and at a cheaper cost compared to traditional composite materials. This waste, located in open-air tanks with no use, could be used to cover facades or as flooring for areas with high usage levels, such as supermarkets. The study was recently published in the scientific journal *Material Letters* (Elsevier).

The study has replaced traditional raw materials (kaolin and commercial sodium borate) with a residue of clay called vermiculite and a phosphate (amblygonite), which makes it possible to obtain green, transparent glass that can be turned into glass-ceramic with an outer layer which boasts an iridescent or metallic effect.

Both clay (vermiculite) and the phosphate (amblygonite) can be found in abandoned mines in Spain inside open-air tanks. Specifically, there are several vermiculite deposits in the Andalusian provinces of Huelva, Almeria and Malaga. For example, in Santa Olalla del Cala in Huelva, there is a deposit from which this mineral was extracted, for insulation

purposes. Furthermore, there are open-air deposits of phosphates, such as amblygonite, in Cáceres (Extremadura), used in the past as an ornamental stone.

Specifically, the research shows that the glass obtained from mixing vermiculite with amblygonite shows an increased tendency to crystallise compared to the mixture of vermiculite with traditional raw materials such as commercial sodium borate, which represents notable conservation of raw materials.

**More information:** J. Ma. Rincón et al. Vitrification and derived glass-ceramics from mining wastes containing vermiculite and lithium aluminium phosphate, *Materials Letters* (2018). [DOI: 10.1016/j.matlet.2018.05.001](https://doi.org/10.1016/j.matlet.2018.05.001)

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