‘Digital ivory’ saves artworks

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A synthetic material that looks identical to elephant ivory, and the first that can be 3D printed, has been used to restore historic artwork that includes ivory made from tusks. Dubbed ‘Digory’ – for ‘digital ivory’ – it consists of a translucent mixture of synthetic acrylic resin and particles of tricalcium phosphate. Elephant ivory was once widely used in artworks, but the international trade in ivory has been banned since 1989.

Digory can be 3D printed at high resolution with a technique called stereolithography, which uses laser light to cross-link polymers within the 3D ‘ink’ and build up layers into complex shapes. Digory boasts the same optical and mechanical properties as elephant ivory and can be colour-matched. It can then be polished, carved, drilled, or glued just like real ivory.

Elephant tusks were a traditional source of ivory

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1. Digory is a composite. How many materials usually make up a composite?
2. What substance is the ‘matrix’ in Digory?
3. Explain what effect crosslinks will have on the properties of a polymer.