



Using silkworm fibres in space

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Weak intermolecular forces hold highly aligned nanofibrils in the silk together. These forces allow the fibrils to separate when a breakage occurs, deflecting cracks into the spaces between fibres. Parallel cracks form in a 3D manner meaning less energy is carried by the major crack. This mechanism prevents catastrophic breakages at very low temperatures. In addition, the more disordered molecular chains the silks contain, the more ductile they are at low temperatures. This is the opposite behaviour from synthetic polymer fibres.

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1. What does ductile mean?
2. Explain why scientists think the silkworm fibres could be useful in space.
3. Silk fibres contain polymer chains. Describe the bonding within a polymer chain and between them.