

Self-healing polymer 'starfish' prolong lifetime of automotive oils

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Researchers have created self-healing polymers that could extend the lifetime of automotive oils. These polymers are suitable to add to lubricants and could maintain the physical properties of engine oils for longer, they claim helping engine efficiency. Biological materials, such as skin, self heal following damage giving inspiration for these new materials.

Polymers are often added to automotive oils to control important physical properties such as viscosity but mechanical and [thermal stress](#) can break the polymers decreasing the efficiency and how they affect the oils properties. The research team, led by Professor David Haddleton, of the University of Warwick have now designed a self-healing, star-shaped polymer for use as a viscosity modifier.

The methacrylate [polymer](#) has vulnerable long arms which be broken off if stressed reducing performance. The research team found they could add a particular chemical combination to the polymer's backbone which, almost like a starfish, which allow broken arms to reform via a "Diels Alder cycloaddition reaction" in a self healing reaction.

The research team now plan to 'optimise the chemistry before passing it on to our industrial collaborators, Lubrizol, for development in automotive lubricant applications,' says Professor Haddleton.

More information: The research paper "Self-healing polymers prepared via living radical polymerisation" by Jay A. Syrett, Giuseppe

Mantovani, William R. S. Barton, David Price and David M. Haddleton, has just been published in *Polymer Chemistry*. [DOI: 10.1039/b9py00316a](https://doi.org/10.1039/b9py00316a)

Provided by University of Warwick

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