The discovery of Nylon

Topics

Polymers, chemists

Nylon was first produced in 1935 by the American chemist Wallace Hume Carothers (1895 – 1937). Carothers was a brilliant chemist – he was made head of his college chemistry department before completing the course himself! Later he researched into polymers at Harvard University before being 'head hunted' in 1928 by the DuPont Company with the aim of producing a polymer that could be a substitute for natural fibres such as wool, cotton and silk. This was a bold move because, at the time, many chemists were far from convinced that it would be possible to make giant polymer molecules.

Carothers' initial results were disappointing and it took seven years to make a material that had the required properties. One stroke of luck resulted from a light-hearted challenge in the laboratory to see how far a lump of polyester (a polymer similar to Nylon) could be stretched. The resulting fibre had properties quite different to those of the original lump because the molecules became aligned. The same trick worked with Nylon and eventually a fibre with properties similar to silk was produced. When Nylon is mass produced, the polymer molecules are aligned as they pass through the tiny holes in the spinneret used to form the Nylon into fibres.

Nylon went into production in 1939 and soon replaced silk for making sheer stockings. Silk comes from the cocoons of silk worms - making it is very labour-intensive and it is therefore expensive. As well as being cheaper, Nylon was more stretchy and thus less prone to wrinkling. Nylon's takeover from silk was so comprehensive that 'nylons' became a synonym for stockings and the term was in everyday use until the 1960s. This near-universal usage is why 'Nylon' is not in fact a trademark – DuPont's lawyers felt that it would be too expensive to try to restrict the use of such an everyday word. Nylon stockings first went on sale in the USA on 15th May 1940. The whole stock of 5 million pairs sold out in a single day.

The outbreak of the Second World War led to a more pressing demand for Nylon – to replace silk for the canopies of parachutes. There is newsreel footage of the time that shows Hollywood starlets peeling off their 'nylons' to be melted down and the Nylon re-used to make parachutes. This is a nice illustration of the fact that Nylon is a thermoplastic.

Carothers did not live to see Nylon go into mass production. He suffered from depression and took his own life in 1937 by taking cyanide. Carothers' wife was pregnant at the time and his daughter was born after his death.

It is often said the name Nylon originated from **N**ew **Y**ork **Lon**don, DuPont's twin headquarters. This is not the case; the name was made up by a committee and was intended to trip easily off the tongue. Other names considered included Duparooh, Delawear, Nusilk, Wacara (a tribute to Wallace Carothers) and Mourshеen.

5.4 million tonnes of Nylon are currently manufactured each year worldwide and it is used for many applications as well as clothing, carpets, engineering parts, tyre cords and toothbrush bristles to name but a few.