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DIAPER CHANGE: RECYCLING NAPPIES WITH UV LIGHT



SUSTAINABILITY

A novel process effectively degrades nappies without needing any chemicals or heat

Spotted: It's estimated that 250 million single-use nappies are thrown away daily worldwide. The majority of these nappies end up in landfills and the environment, or are incinerated – including compostable or biodegradable alternatives.

Traditionally, nappies have been a challenging product to recycle, given that the liners consist of special polymers – known as superabsorbers – that are non-biodegradable, insoluble in water, and degrade rather than melt. Normally, strong acids must be used to recycle superabsorbers, 'cutting' the chains that stabilise the polymers in an expensive and heat-intensive process. Now, however, researchers at Karlsruhe Institute of Technology (KIT) have found a way to improve the complex recycling process.

The scientists found that the crosslinked sodium polyacrylate polymers that make up a nappy's superabsorbent lining will degrade under ultraviolet (UV) light after taking in water. The light breaks the chains that link the polymers, which then become so loose that they swim in water and turn into liquid fibres.

For their studies, the researchers cut out the liners from conventional nappies, wet them with water, and exposed them to a 1000-watt lamp. After five minutes at room temperature, the solid material turned into a liquid that dropped into a collector. The team could then use existing techniques to convert the liquid into new adhesives and dyes. According to the researchers, their method is about 200 times faster than methods that use acids.

Nappies are also usually thrown out with babies' waste, making them more challenging to recycle. Though the researchers used clean diapers for their tests, they do think it is possible to separate

n effective tool to help the environment and mitigate the effects of climate change. Springwise has spotted many ways UV light is used, such as in [revolutionising rice farming](#) or [breaking down hard-to-recycle plastic](#).

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Takeaway:

Every minute, [more than 300,000](#) disposable nappies are incinerated, sent to landfills, or disposed of in the environment. The vast majority of these will contain plastic, meaning they'll end up breaking down into microplastics that will litter precious land and marine ecosystems. Reusable nappies are an option, but for many parents, these aren't convenient. Using UV light shows a promising way to recycle plastic-based nappies that is inexpensive, quick, efficient, and doesn't cause considerable environmental damage.