Environment News Futures

Faster-degrading Plastic Could Promise Cleaner Seas

April 20, 2020—Cornell University

To address plastic pollution plaguing the world's seas and waterways, Cornell University chemists have developed a new polymer that can degrade by ultraviolet radiation, according to research published in the *Journal of the American Chemical Society*.

"We have created a new plastic that has the mechanical properties required by commercial fishing gear. If it eventually gets lost in the aquatic environment, this material can degrade on a realistic time scale," said lead researcher Bryce Lipinski, a doctoral candidate in the laboratory of Geoff Coates, professor of chemistry and chemical biology at Cornell University. "This material could reduce persistent plastic accumulation in the environment."

Commercial fishing contributes to about half of all floating plastic waste that ends up in the oceans, Lipinski said. Fishing nets and ropes are primarily made from three kinds of polymers: isotactic polypropylene, high-density polyethylene, and nylon-6,6, none of which readily degrade.

"While research of degradable plastics has received much attention in recent years," he said, "obtaining a material with the mechanical strength comparable to commercial plastic remains a difficult challenge."

Coates and his research team have spent the past 15 years developing this plastic called isotactic polypropylene oxide, or iPPO. While its original discovery was in 1949, the mechanical strength and photodegradation of this material was unknown before this recent work. The high isotacticity (enchainment regularity) and polymer chain length of their material makes it distinct from its historic predecessor and provides its mechanical strength.

Lipinski noted that while iPPO is stable in ordinary use, it eventually breaks down when exposed to UV light. The change in the plastic's composition is evident in the laboratory, but "visually, it may not appear to have changed much during the process," he said.

The rate of degradation is light intensity-dependent, but under their laboratory conditions, he said, the polymer chain lengths degraded to a quarter of their original length after 30 days of exposure.

Ultimately, Lipinski and other scientists want to leave no trace of the polymer in the environment. He notes there is literature precedent for the biodegradation of small chains of iPPO which could effectively make it disappear, but ongoing efforts aim to prove this.

This research was supported by the National Science Foundation's Center for Sustainable Polymers, the NSF-supported NMR Facility at Cornell, and the Cornell Center for Materials Research.

Why Relying on New Technology Won't Save The Planet

April 20, 2020—Lancaster University

Over-reliance on promises of new technology to solve climate change is enabling delay, say researchers from Lancaster University. They argue instead for cultural, social and political transformation to enable widespread deployment of both behavioral and technological responses to climate change.

Their research published in *Nature Climate Change* calls for an end to a longstanding cycle of technological promises and reframed climate change targets.

Contemporary technological proposals for responding to climate change include nuclear fusion power, giant carbon sucking machines, ice-restoration using millions of wind-powered pumps, and spraying particulates in the stratosphere.

Researchers Duncan McLaren and Nils Markusson from Lancaster Environment Centre say that: "For forty years, climate action has been delayed by technological promises. Contemporary promises are equally dangerous. Our work exposes how such promises have raised expectations of more effective policy options becoming available in the future, and thereby enabled a continued politics of prevarication and inadequate action.

"Prevarication is not necessarily intentional, but such promises can feed systemic 'moral corruption', in which current elites are enabled to pursue self-serving pathways, while passing off risk onto vulnerable people in the future and in the global South.

The article describes a history of such promises, showing how the overarching international goal of 'avoiding dangerous climate change' has been reinterpreted and differently represented in the light of new modelling methods, scenarios and technological promises.

The researchers argue that the targets, models and technologies have co-evolved in ways that enable delay: "Each novel promise not only competes with existing ideas, but also downplays any sense of urgency, enabling the repeated deferral of political deadlines for climate action and undermining societal commitment to meaningful responses.

They conclude: "Putting our hopes in yet more new technologies is unwise. Instead, cultural, social and political transformation is essential to enable widespread deployment of both behavioural and technological responses to climate change."

The researchers map the history of climate targets in five phases: "stabilization," followed by a focus on "percentage emissions reductions," shifting to "atmospheric concentrations" (expressed in parts per million), "cumulative budgets" (in tonnes of carbon dioxide), and currently "outcome temperatures."

- In the first phase (around Rio, 1992) technological promises included improved energy efficiency, large-scale enhancement of carbon sinks, and nuclear power
- In the second phase around the Kyoto summit (1997) policy promises focused on cutting emissions with efficiency, fuel switching and carbon capture and storage (CCS).
- In the third phase (around Copenhagen, 2009), CCS became linked to bioenergy, while policy focused on atmospheric concentrations.
- Phase four saw the development of sophisticated global carbon budgeting models and the emergence of a range of putative negative emissions technologies.
- Policy in phase five focused increasingly on temperature outcomes, formalised with the Paris accord of 2015

New Geochemical Tool Reveals Origin of Earth's Nitrogen

Novel analysis method may also be useful for monitoring volcanic activity

April 16, 2020—Woods Hole Oceanographic Institution

Researchers have used a new geochemical tool to shed light on the origin of nitrogen and other volatile elements on Earth, which may also prove useful as a way to monitor the activity of volcanoes.

Yellowstone National Park (stock image).
Credit: © Lane Erickson/Adobe Stock

Researchers at Woods Hole Oceanographic Institution (WHOI), the University of California Los Angeles (UCLA) and their colleagues used a new geochemical tool to shed light on the origin of nitrogen and other volatile elements on Earth, which may also prove useful as a way to monitor the activity of volcanoes. Their findings were published April 16, 2020, in the journal *Nature*.

Nitrogen is the most abundant gas in the atmosphere, and is the primary component of the air we breathe. Nitrogen is also found in rocks, including those tucked deep within the planet's interior. Until now, it was difficult to distinguish between nitrogen sources coming from air and those coming from inside the Earth's mantle when measuring gases from volcanoes.

"We found that air contamination was masking the pristine 'source signature' of many volcanic gas samples," says WHOI geochemist Peter Barry, a coauthor of the study.

Wildlife samples to be tested for coronavirus soon

http://timesofindia.indiatimes.com/articleshow/75083486.cms?utm_source=contentofinterest & utm_medium=text&utm_campaign=cppst

Coronavirus forces UN body to postpone its flagship climate..

*https://*timesofindia.indiatimes.com/*home/environment/global-warming/...*

3 species from India among 10 to be on global endangered list

New Delhi

Ten endangered species of migratory animals/birds from across the globe, including three from India (Great Indian Bustard, Asian Elephant and Bengal Florican), will be included in a special global list for protection under the 'Convention on Conservation of Migratory Species' (CMS) — an international treaty to protect such species throughout their range countries.

Importing African Cheetahs

- This signal has revived a decade-long debate over the controversial plan first floated in 2009 and shot down by the SC in 2013.
- Cheetahs are the only large carnivore to have gone extinct in India.
- In 2009, the then Environment Minister Jairam Ramesh cleared a proposal to import a few cheetahs back in the Indian wild.
- At a 2009 meeting, the Namibia-based Cheetah Conservation Fund offered to help bring in African cheetahs in stages over the next decade, possibly starting in early 2012.
- By 2010, India's cheetah plan was ready and the Centre approved Rs 50 crore for the programme in 2011.