



Joint news release

BASF, Cargill and Novozymes achieved another milestone in bio-based acrylic acid

- **Success in making superabsorbent polymer from bio-based acrylic acid**
- **Process selected for production of 3-hydroxypropionic acid (3-HP) and conversion to bio-based acrylic acid**

LUDWIGSHAFEN, GERMANY – MINNEAPOLIS, USA – COPENHAGEN, DENMARK –

September 15, 2014 – BASF, Cargill and Novozymes today announced the achievement of another milestone in their joint development of technologies to produce acrylic acid from renewable raw materials. The team has demonstrated the successful conversion of 3-hydroxypropionic acid (3-HP), to glacial acrylic acid and superabsorbent polymers. Moreover they have selected the process for further scale-up.

In August 2012, BASF, Cargill and Novozymes announced their joint agreement to develop a process for the conversion of renewable raw materials into bio-based acrylic acid. In July 2013, the partners successfully demonstrated the production of 3-hydroxypropionic acid (3-HP), one possible precursor to acrylic acid, at pilot scale.

BASF initially plans to use the bio-based acrylic acid to manufacture superabsorbent polymers. Currently, acrylic acid is produced by the oxidation of propylene derived mainly from the refining of crude oil. “After just 18 months we have selected the preferred process to convert 3-HP into glacial acrylic acid. Now we are working full force on the set-up of a small integrated pilot plant until the end of this year,” said Teresa Szelest, Senior Vice President Global Hygiene Business at BASF. Together with the pilot plant for 3-HP, operated by Cargill and supported by Novozymes, this will further support BASF’s plans for fast market entry of superabsorbent polymers derived from bio-based acrylic acid.

“We are pleased to see the project progressing with high pace and commitment towards commercialization,” said Kristian Bjørneboe, Vice President Business Creation and Acquisition at Novozymes. “We are refining and pursuing options on how to move quickly towards commercial scale production of 3-HP to acrylic acid to meet market demands for

consumer goods based on renewable raw materials. Meanwhile, strain and fermentation optimization towards commercial scale requirements is progressing steadily.”

“Cargill came together with BASF and Novozymes to do what had not been done ever before. We have been working together for less than two years and we have made great progress toward our common goal,” said Jack Staloch Vice President of Research and Development at Cargill. “It’s a great example of what can be accomplished when industry leaders with unique expertise in biotechnology and chemistry come together to create new innovations.”

Superabsorbent polymers and other products derived from bio-based acrylic acid will be an innovative offer to the market and will meet consumer and industry demand for consumer goods based on renewable raw materials and sustainable supply chains. BASF is the world’s largest producer of acrylic acid, a high-volume chemical that feeds into a broad range of products, including superabsorbent polymers that can soak up large amounts of liquid, used primarily for diapers and other hygiene products.

About BASF

At BASF, we create chemistry – and have been doing so for 150 years. Our portfolio ranges from chemicals, plastics, performance products and crop protection products to oil and gas. As the world’s leading chemical company, we combine economic success with environmental protection and social responsibility. Through science and innovation, we enable our customers in nearly every industry to meet the current and future needs of society. Our products and solutions contribute to conserving resources, ensuring nutrition and improving quality of life. We have summed up this contribution in our corporate purpose: We create chemistry for a sustainable future. BASF had sales of about €74 billion in 2013 and over 112,000 employees as of the end of the year. BASF shares are traded on the stock exchanges in Frankfurt (BAS), London (BFA) and Zurich (AN). Further information on BASF is available on the Internet at www.basf.com.

About Cargill

Cargill provides food, agriculture, financial and industrial products and services to the world. Together with farmers, customers, governments and communities, we help people thrive by applying our insights and nearly 150 years of experience. We have 143,000 employees in 67 countries who are committed to feeding the world in a responsible way, reducing environmental impact and improving the communities where we live and work. For more information, visit Cargill.com and our [News Center](#).

About Novozymes

Novozymes is the world leader in bioinnovation. Together with customers across a broad array of industries Novozymes creates tomorrow’s industrial biosolutions, improving its customers’ business and the use of our planet’s resources.

With over 700 products used in 130 countries, Novozymes' bioinnovations increase industrial performance and safeguard the world's resources by offering superior and sustainable solutions for tomorrow's ever-changing marketplace. Read more at www.novozymes.com.

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