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Singapore: World-leading nylon producer Invista and biotechnology firm LanzaTech have signed a joint development agreement focused on bio-based butadiene. According to the agreement, Invista and LanzaTech will collaborate on projects to develop one-step and two-step technologies to convert industrial waste gas carbon monoxide into butadiene. Initial commercialization is expected in 2016.

The collaboration will initially focus on the production of butadiene in a two-step process from LanzaTech CO-derived 2,3-butanediol (2,3 BDO). A direct single step process will also be developed to produce butadiene directly through a process of gas fermentation.

Invista and LanzaTech will also collaborate on the joint development of tools that will allow the extension of this technology - once developed - for the direct production of other industrial chemicals, including nylon intermediates, from carbon monoxide containing waste gases, utilizing LanzaTech's gas fermentation technology and proprietary biochemical platform. Invista is building internal biotechnical capability to develop biological routes to its products and feedstocks.

Butadiene is an important intermediate chemical used in the production of synthetic rubber and various plastics. It is also a key intermediate chemical used by INVISTA in its proprietary, butadiene-based adiponitrile (ADN) production technologies. ADN is a critical intermediate chemical used in the manufacture of nylon 6,6.

"As we seek innovative solutions to increase the global supply of butadiene, we believe developing a cost competitive biological route to butadiene will help assure ample supply and reduce price volatility," said Bill Greenfield, executive vice president of INVISTA's nylon intermediates business. "We believe this collaboration effort is a great opportunity to leverage our own internal biotechnical research with the unique and impressive capabilities that LanzaTech has developed."

According to Jennifer Holmgren, CEO of LanzaTech, "This collaboration is an important next step toward our vision of a diversified fuels and chemical portfolio. Joining forces with INVISTA's world-class research team will enable us to accelerate the commercialization of a biological route to butadiene, further demonstrating that gas fermentation is an important route for

the production of both fuels and chemicals."

LanzaTech's 15,000 gallon per year pilot facility at a steel mill in New Zealand produces ethanol and 2,3 BDO from waste carbon monoxide gas. In Shanghai, China, LanzaTech's 100,000-gallon-per-year demonstration uses waste gases from a Baosteel steel mill to produce ethanol.