

**First Adoption of
Naturally Derived Ketone Bodies—Produced by Osaka Gas through Its Unique
Fermentation Process—as Cosmetic Raw Material**

December 15, 2021
Osaka Gas Co., Ltd.

3-hydroxybutyric acid (hereinafter "3HB")^{*1} produced by Osaka Gas Co., Ltd. (President: Masataka Fujiwara, hereinafter "Osaka Gas"), which is naturally derived ketone bodies made through a unique fermentation process, has come to be adopted for the first time as a raw material for cosmetics.

Osaka Gas Chemicals Co., Ltd. (hereinafter "Osaka Gas Chemicals"), a subsidiary of Osaka Gas, sells 3HB for cosmetics called "OHALOS." On December 15, FDP Co., Ltd. (hereinafter "FDP") launches the sale of a body care product containing OHALOS.

3HB is a substance produced in the liver using fat in the body as a raw material when sugar, an energy source in the body, is depleted (in the case of carbohydrate restriction). In recent years, it has been found that 3HB has various physiological functions in addition to its role as an energy source in place of sugar.

Currently, 3HB is sold as a supplement mainly in the United States, but conventional 3HB is produced by chemically synthesizing non-natural raw materials. Under these circumstances, the need for naturally derived 3HB has been increasing.

In 2017, through joint development with the National Institute of Advanced Industrial Science and Technology, Osaka Gas succeeded in establishing a technology^{*2} to mass-produce high-purity 3HB from sugar cane and other plant-derived sugars by utilizing the company's unique fermentation technology accumulated through the development of biogas production processes.

Meanwhile, in 2018 and May 2021, the name "3HB" was listed in the International Nomenclature Cosmetic Ingredient (INCI names)^{*3} established by the Personal Care Products Council.

Osaka Gas Chemicals launched the sale of OHALOS in October 2021, and from December 15, the face and body milk "Halomonasrim," which contains OHALOS, is on sale as a product of FDP.

In its cosmetics business, Osaka Gas Chemicals has been enjoying steady sales growth by rolling out the OVEIL series consisting of 11 types of raw materials for make-up and the like.

3HB is expected to be used in health food products and supplements as well as cosmetics. Osaka Gas and Osaka Gas Chemicals will aim to expand the range of 3HB use.

The Daigas Group remains committed to becoming a corporate group that contributes to further improving its customers' daily lives and businesses by creating new businesses in growing industries.

*1: In this announcement, both of the following are referred to as 3HB: 3-hydroxybutyric acid, and a collective combination of 3-hydroxybutyric acid and its derivatives.

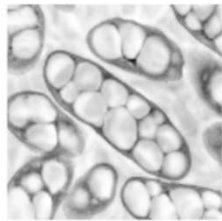
*2: Produced by fermenting raw materials, mainly including sugar cane and other plant-derived sugars, through the use of Halomonas

*3: Internationally recognized names defined to identify cosmetic ingredients

1. Technology for the production of 3HB made by Osaka Gas using its own fermentation process



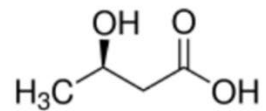
Sugars



Halomonas



Ketone bodies
(3-hydroxybutyric acid, 3HB)



More information on the technological development of the Daigas Group is available on the website below.

The Daigas Group is active in a wide range of fields by deepening and expanding the technologies it has cultivated in the energy business.

<https://www.osakagas.co.jp/en/rd/>