

Highly efficient and safe method for carotenoids isomerization

We are looking to out-license the technology for its commercialization.

Novel method to isomerize the all-trans carotenoids to their cis-isomers without using organic solvents or heavy metal catalysts.

◆ Background

Carotenoids are highly sought-after functional ingredients used in a wide range of applications, including food, pharmaceutical, cosmetics, and animal feed. Their consumption is also encouraged because of their well-recognized health benefits. However, carotenoids are highly hydrophobic and practically insoluble in water. In addition, the naturally predominant all-trans isomers exhibit poor solubility, resulting in low bioavailability and difficulties in formulation and processing. To address these challenges, various methods have been employed to isomerize carotenoids in organic solvents, including heat treatment and heavy-metal-catalyzed reactions. However, these approaches raise concerns regarding cost and safety. Therefore, there is a need for effective methods to enhance carotenoid dispersibility and bioavailability.

◆ Description

Kyoto University researchers developed a novel method to readily isomerize trans-carotenoids into cis-carotenoids in a dispersed state within an aqueous medium, without the use of organic solvents or heavy-metal catalysts. This technology is expected to enable efficient conversion to the cis form, thereby improving the bioavailability and solubility of carotenoids. This method utilizes natural compounds suitable for use in food and pharmaceutical applications, and is capable of stabilizing the otherwise unstable cis-form carotenoids.

◆ Development Status

- Carotenoid isomerization demonstrated at a lab scale (0.1–10 mL).
- TRL level4

◆ Applications

- Food, beverage, supplement
- Cosmetics
- Pharmaceuticals

◆ Offer

- Patent License
- Option for Patent License
- Collaborative Research

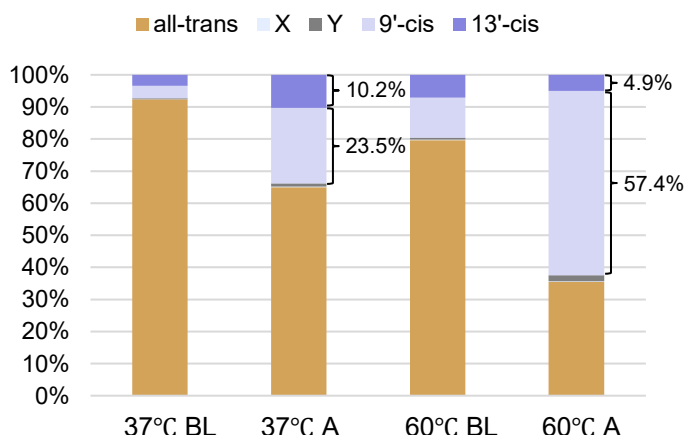


Fig. Relative Amount of Isomer Composition Obtained from Carotenoid Isomerization. Graph shows the converted value (relative value) when the sum of each component is set to 100%, based on the absolute amount of isomer composition calculated after the isomerization reaction. 37°C BL and 37°C A show the results for the blank (BL) and natural ingredient A (A) at 37°C, respectively. 60°C BL and 60°C A show the results at 60°C. X and Y indicate isomers that were detected only in small amounts in the HPLC chromatogram. Higher reaction temperature resulted in larger proportion of cis-isomers of carotenoids.

◆ Contact

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