

Cosmetic ingredients

Sodium Carboxymethyl Dextran (CMD)

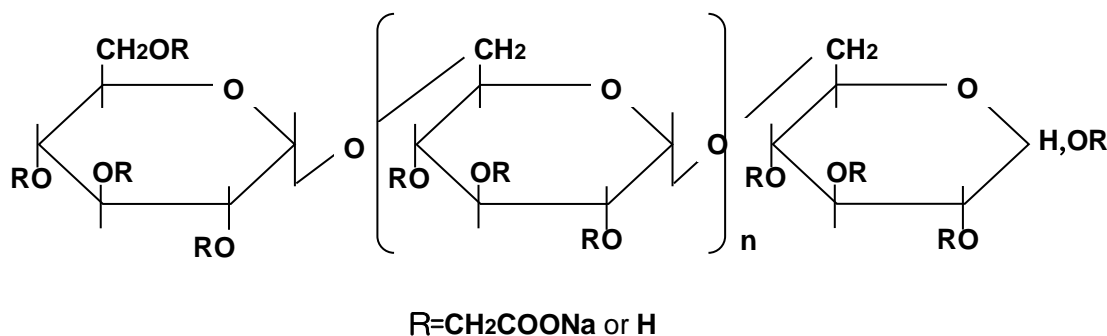


MEITO SANGYO CO., LTD.

Sodium Carboxymethyl Dextran (CMD) is a carboxymethyl etherification product of dextran, which is a natural product, and is a very safe cosmetic ingredient with viscosity and moisturizing properties. The aqueous CMD solution gives the skin a moisturizing and pleasant feel and does not cause "wrinkles" like the cellulosic thickeners. In addition, CMD forms a complex salt with a cationic water-soluble polymer, forms a film with a moisturizing effect, and can be expected to adhere to the skin and hair.

■ Name/Structural formula

- Ingredient name** : Sodium Carboxymethyl Dextran
(Japanese Standards of Quasi-drug Ingredients, 2021, code: 511016)
- Display name** : Carboxymethyl dextran Na (ingredient number: 551010)
- INCI name** : Sodium Carboxymethyl Dextran
- CAS number** : 39422-83-8
- Chinese name** : 羧甲基糊精钠 (国際化粧品原料標準中文名称目録(2010))
: 羧甲基糊精钠 (已使用化妆品原料名称目録 (ver. 2021))



■ Product lineup

Product	Average molecular weight (raw material dextran)	Viscosity
CMD	About one million to several tens millions	High
CMD-500	About 500,000	Low

【Table of contents】

■ List of features	3
Viscosity	4
① Influence of concentration	4
② Influence of temperature	4
③ pH	5
④ Change over time	6
⑤ Additives	6
Moisturizing property	8
① Comparison with existing moisturizers	8
② Comparison with hyaluronic acid	8
③ Moisture retention under high/low humidity (compared to butylene glycol)	9
Safety	10
■ Specification	10
■ Packaging form	10
■ Handling precautions	10
■ Reference information	11
Solubility	11
Various solvents	11
Ethanol	11
Prescription (example)	11
① Lotion	11
② Body lotion	12
■ Contact	12

■ List of features

◎ **Viscosity**

A thickening effect is expected by adding Sodium Carboxymethyl Dextran.

This effect is strong in the neutral to weakly alkaline region and stable over time, but the effect decreases due to high/low pH conditions and addition of inorganic salts.

⇒ **[see page 4]**

◎ **Moisturizing property**

Sodium Carboxymethyl Dextran has a moisturizing property, and its performance is not inferior to that of hyaluronic acid (HA).

In addition, the moisture retention of Sodium Carboxymethyl Dextran is less affected by the surrounding humidity, and maintains an appropriate moisture absorption and retention even in low humidity.

⇒ **[see page 8]**

◎ **Safety**

Since dextran, which has good biocompatibility, is used as the raw material, it is extremely safe with low toxicity and irritation.

⇒ **[see page 10]**

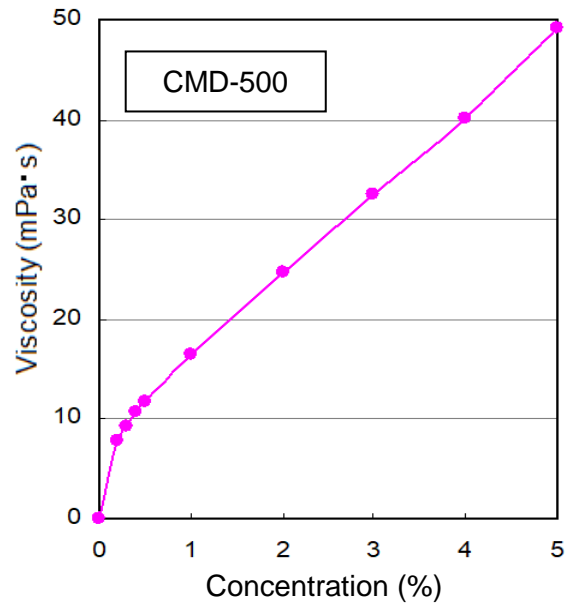
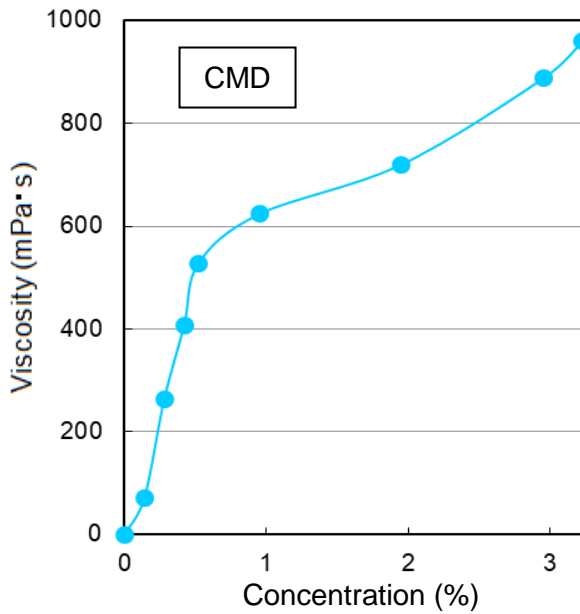
Viscosity

This section shows the variation of Sodium Carboxymethyl Dextran's viscosity under various conditions. The equipment and samples used are as follows.

Sample	Viscometer	Rotor, used
CMD	: Brookfield viscometer	No.2, 6 rpm
CMD-500	: RE-85 viscometer	1° 34'x24, 100 rpm

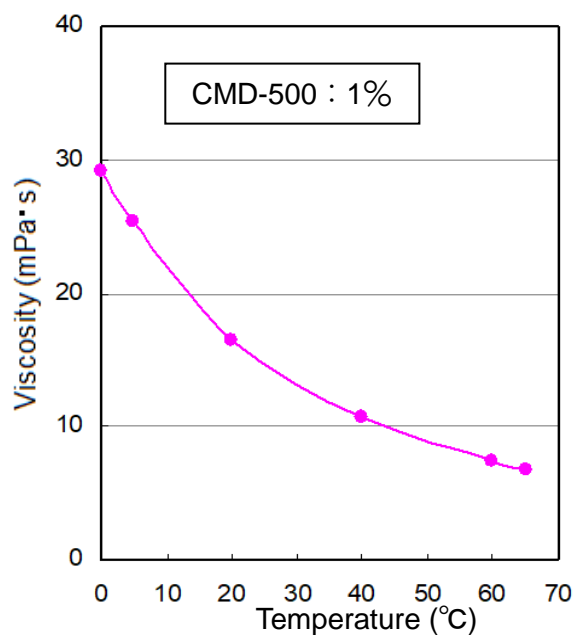
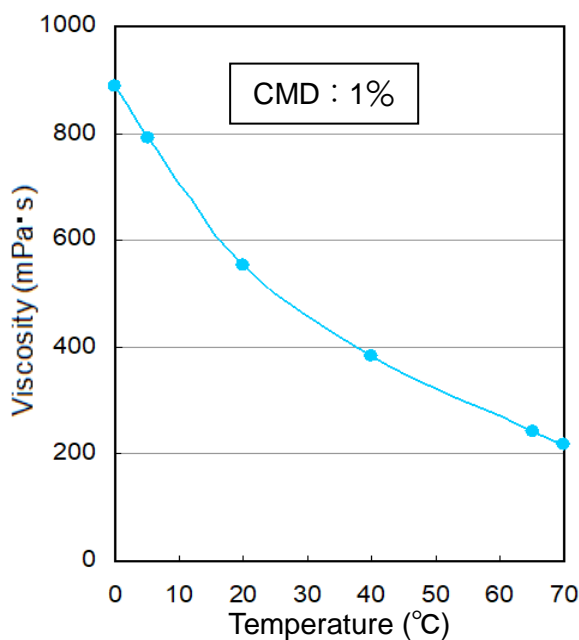
① Influence of concentration (temperature: 20°C)

The viscosity increases as the concentration of sample is increased.



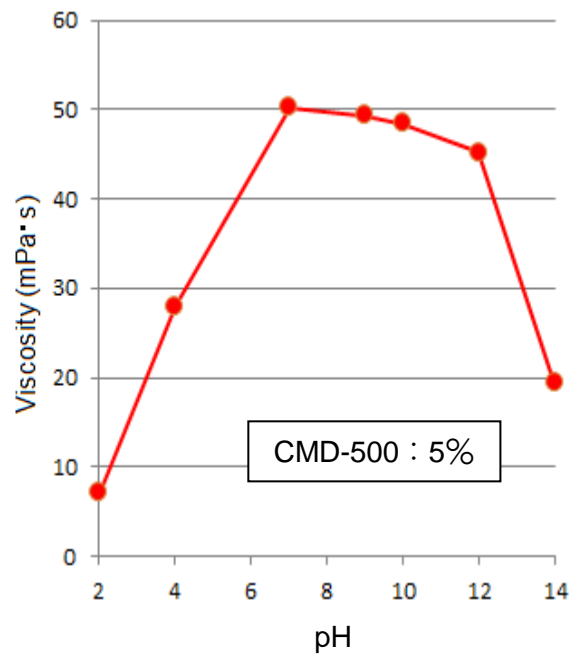
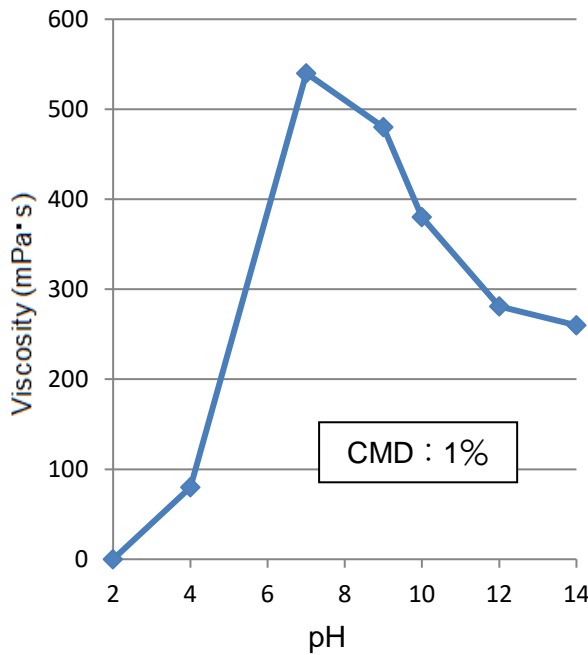
② Influence of temperature

Viscosity decreases with increasing temperature and this behavior is reversible.

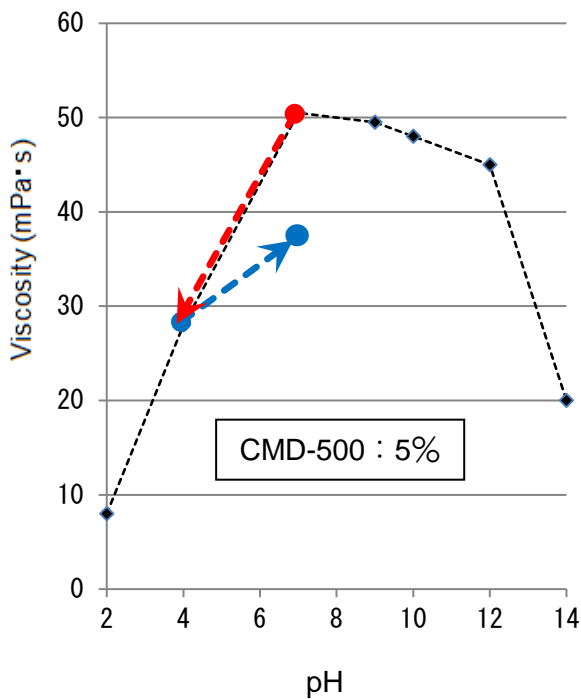


㊦ pH (Temperature: 20°C)

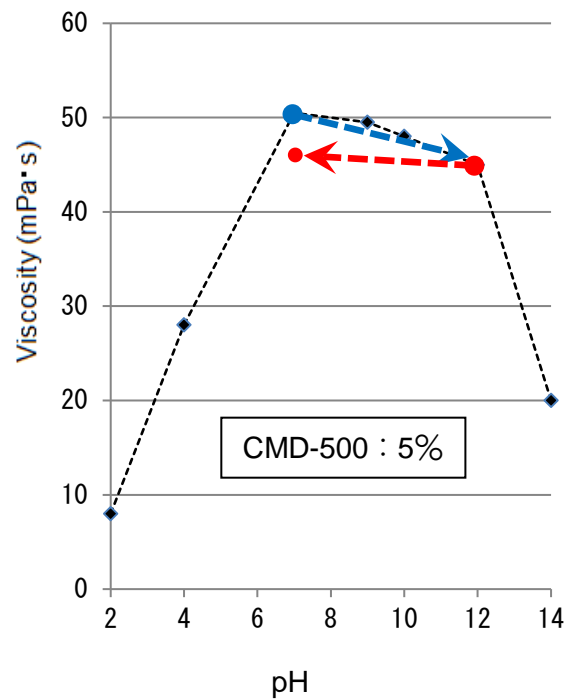
Like sodium carboxymethyl cellulose (CMC), Sodium Carboxymethyl Dextran causes a decrease in viscosity at low and high pH, but does not precipitate at low pH like CMC.



When the pH of the solution is once changed and then returned to the original value by neutralization, the viscosity tends to recover, but it does not return to the original level due to the influence of the salt produced (see ㊦ additives).



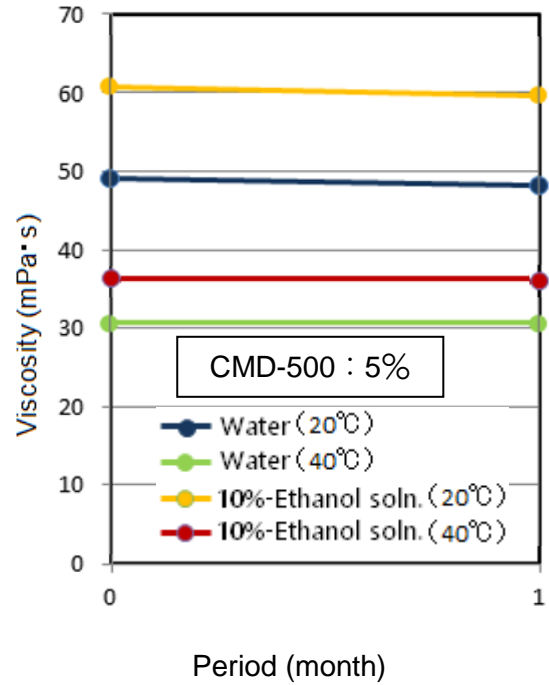
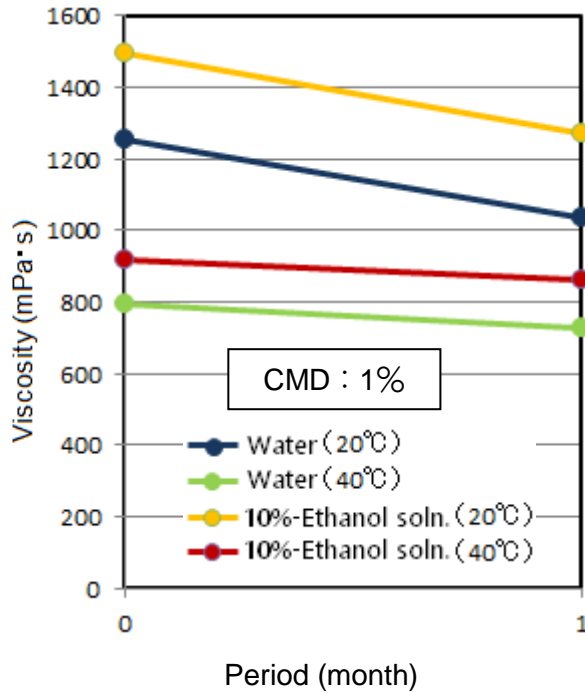
【 pH 7 ⇒ pH 4 ⇒ pH 7 】
Neutral Acidic Neutral



【 pH 7 ⇒ pH 12 ⇒ pH 7 】
Neutral Basic Neutral

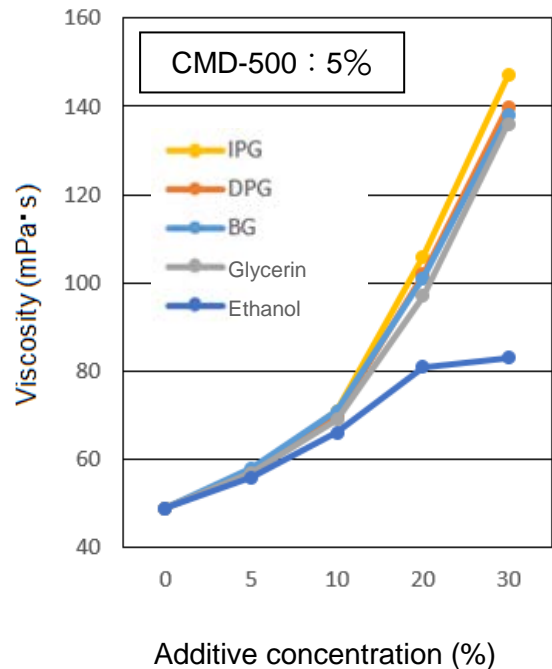
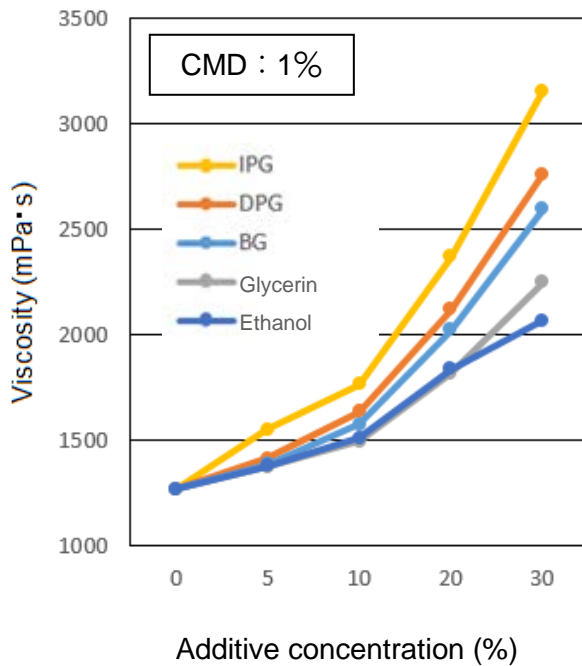
④ Change over time

There is little or no change in viscosity over time in aqueous or aqueous ethanol solutions.

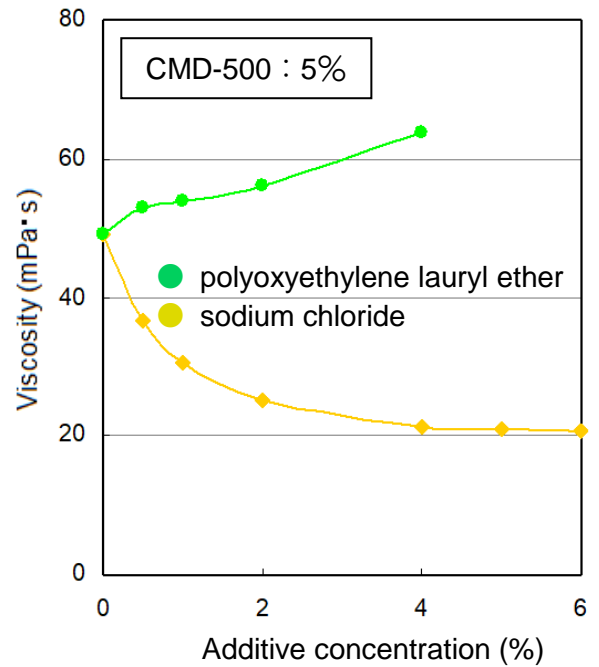
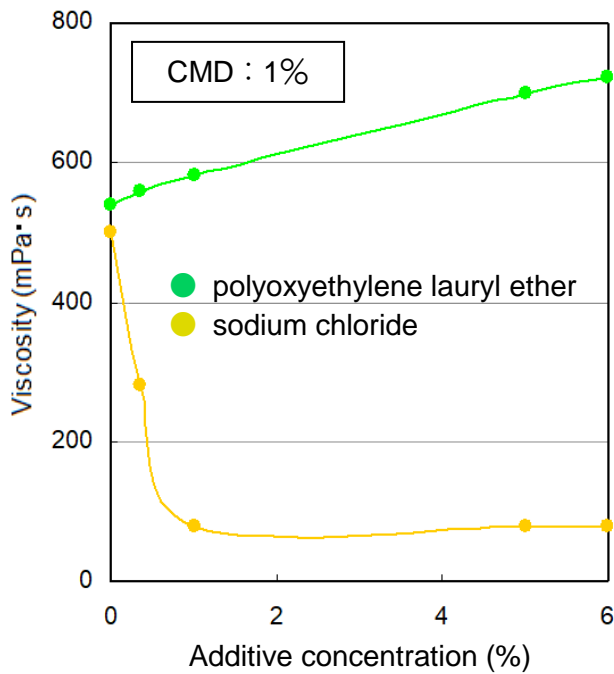


⑤ Additives (temperature: 20°C)

The viscosity of the aqueous solution of Sodium Carboxymethyl Dextran increases with the addition of polyhydric alcohols (isoprene glycol: IPG, dipropylene glycol: DPG, butylene glycol: BG), glycerin and ethanol.



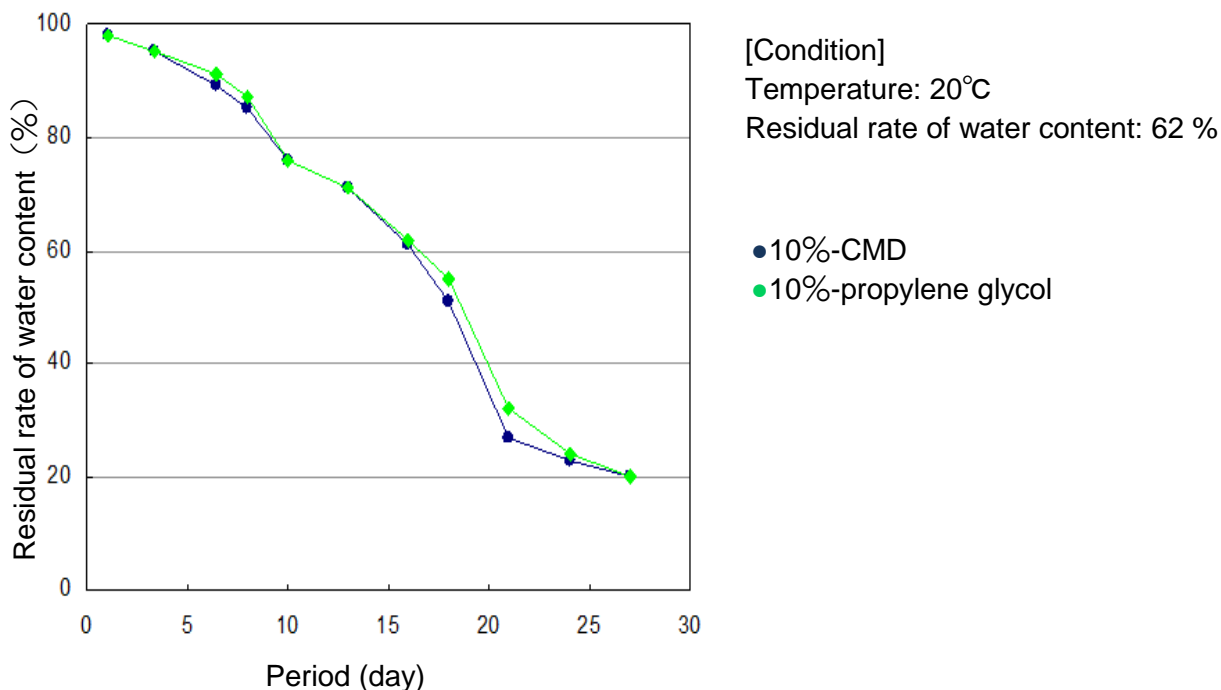
Even if polyoxyethylene lauryl ether is added to the aqueous solution of Sodium Carboxymethyl Dextran, the viscosity does not increase significantly. On the other hand, when sodium chloride is added, the viscosity drops sharply.



Moisturizing property

① Comparison with existing moisturizers

It has the same moisturizing effect as existing moisturizer propylene glycol (PG).



② Comparison with hyaluronic acid

CMD shows moisturizing properties equivalent to or higher than hyaluronic acid (HA), which has high water retention/moisturizing properties.

[Test condition]

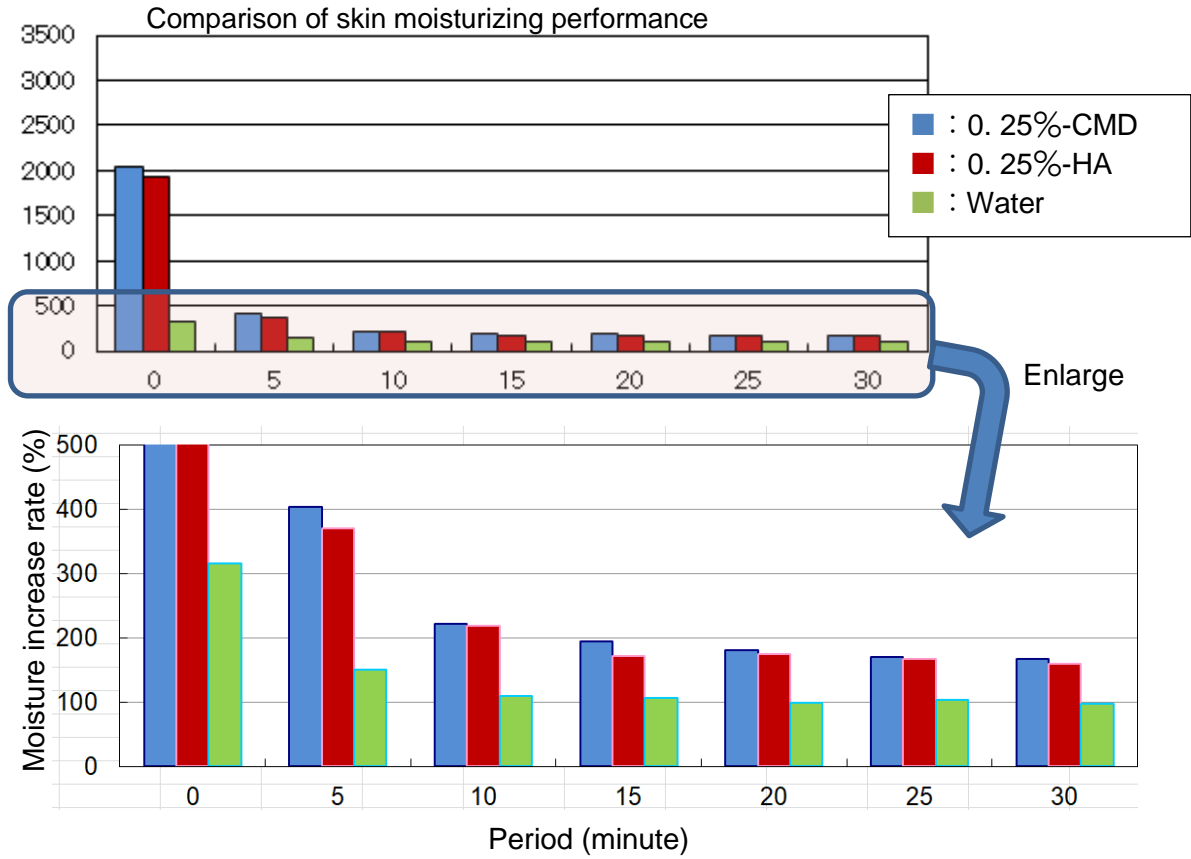
- Subjects: six
- Test environment
 - Temperature : 20~24°C
 - Relative humidity : 42~60%

[Test method and result]

Two types of samples were prepared, each containing 0.25% CMD and 0.25% HA added to a 10% butylene glycol (BG) aqueous solution.

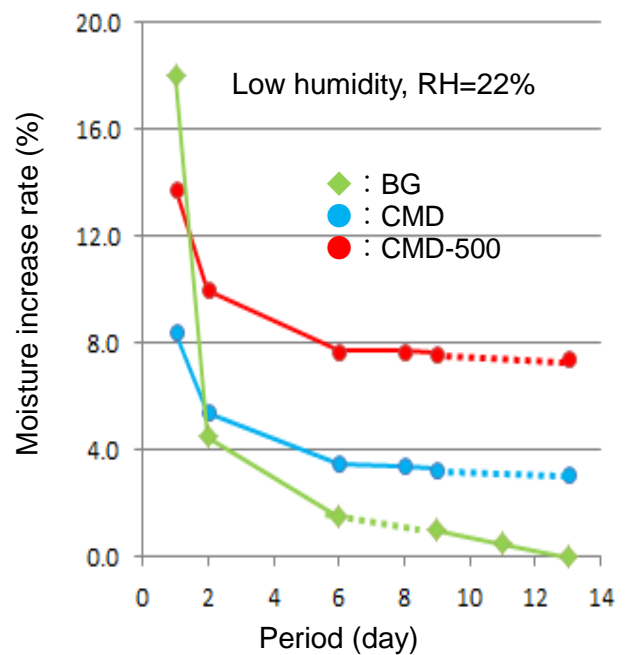
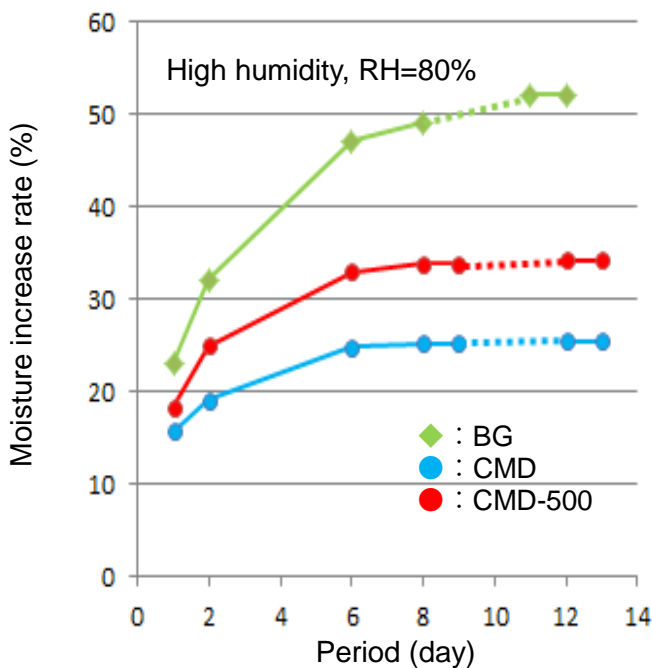
These two samples and water were applied to different parts of the arm, and the skin water content of the applied part from 0 (immediately after application) to 30 minutes was measured every 5 minutes.

As a result, as shown in the graph on the next page, it was found that CMD retains a water content equivalent to or higher than that of HA over 30 minutes after application to the skin.



③ **Moisture retention under high/low humidity (compared to butylene glycol)**

The moisturizing effect of butylene glycol (BG) is highly dependent on relative humidity and exhibits high moisture absorption and retention at high humidity, but the rate of moisture increase decreases significantly at low humidity. On the other hand, it can be seen that Carboxymethyl dextran Na is not easily affected by changes in humidity, regardless of its molecular weight.



Safety

Sodium Carboxymethyl Dextran is produced from dextran, which has good biocompatibility as a raw material, so it is extremely safe with low toxicity and irritation.

Eye mucous membrane irritation	: Negative (SIRC-NRU)
Skin sensitization	: Negative (human, 5% aqueous solution)
Patch test	: Negative (human, 5% aqueous solution)

(Use CMD as sample)

■ Specification (Japanese Standards of Quasi-drug Ingredients, 2021)

Appearance, odor	: White powder, odorless
Identification	Barium chloride : Positive
	Anthrone : Positive
Purity	Heavy metals : 30 ppm or less
	Arsenic : 2 ppm or less
Loss on drying	: 8.0 % or less
Assay (sodium)	: 6.5 to 9.5 %

■ Packaging form (example)

- 5kg packed polyethylene double bag



- carton box



■ Handling precautions

- Store in a cool place, avoiding direct sunlight and moisture
- Be careful not to splash or inhale powder.
- In case of accidental contact with your eyes, wash thoroughly with water.
- Please gargle, wash your hands and wash your face after finishing the work.

■ Reference information (solubility and prescription example)

Solubility

● Solubility in various solvents : sample conc.=2%

Solvent	CMD	CMD-500
Water	○	○
40 % Ethanol	○	○
30 % Isopropanol	○	○
30 % Acetone	○	○
Acetone	×	×

(○ : soluble, × : insoluble)

● Solubility in aqueous ethanol : sample conc.=1%

Ethanol conc. (%)	40	50	60	70	80	90	100
CMD							
CMD-500							

Prescription (example)

① Lotion

Components	:	Rate (%)
CMD	:	1.0
Ethanol	:	20.0
POE sorbitan monolaurate	:	0.5
Allantoin	:	0.1
Preservative	:	Appropriate amount
Fragrance	:	Appropriate amount
Add purified water	:	Total 100.0

② Body lotion

Components	:	Rate (%)
CMD	:	1.0
Ethanol	:	40.0
Hydroxypropyl cellulose	:	1.0
Polyoxyethylene Castor Oil	:	1.0
Preservative	:	Appropriate amount
Fragrance	:	Appropriate amount
Add purified water	:	Total 100.0

■ Contact

For inquiries regarding this product, please contact the following.

Meito Sangyo Co., Ltd.

Fine Chemicals Sales Department

ISSEI BUILDING Annex 2F, 1-18-2, Akebono-cho, Tachikawa, Tokyo, 190-0012, Japan

TEL : +81-42-548-5535, FAX : +81-42-548-5537

<http://www.meito-sangyo.co.jp>

ver. 202108-01



社 会 に 役 立 つ 製 品 を



 **名糖産業株式会社**
MEITO SANGYO CO.,LTD.