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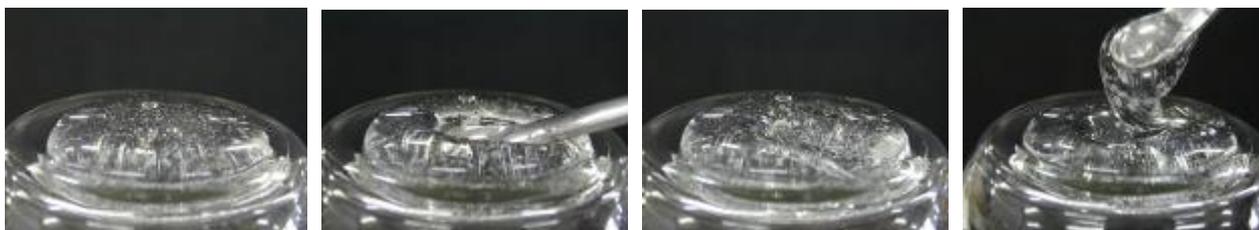
Date prepared : November 13, 2013

Date revised : September 20, 2017

-Hydro gelator - ADEKA NOL GT-730

ADEKA NOL GT-730 is a water soluble polymer which has urethane bond in the structure. It associates water molecule and show thickening effect on water by forming water gel. It is used for cosmetics as gelator.

ADEKA NOL GT-730 is diluted product of GT-700 with butylene glycol and water. Effective component of both products are same.



Features

- ✓ High-elastic / Springy water gel
- ✓ Salt tolerance
- ✓ BHT free
- ✓ Good spray discharge
- ✓ Good solubility in water

Table of ingredients

INCI NAME	Compositions (wt%)
PEG-240/HDI COPOLYMER BIS-DECYLTETRADECETH-20 ETHER	30
BUTYLENE GLYCOL	50
WATER	19.94
POTASSIUM LAURATE ¹⁾	0.03
TOCOPHEROL ²⁾	0.03

1) Carry-over ingredient, Catalyst for synthesis

2) Carry-over ingredient, Antioxidant

Specification

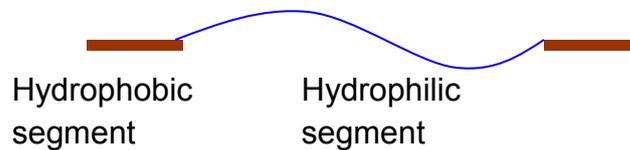
Appearance	Light yellow to light yellow-brown, clear liquid
Viscosity(mPa·s) 3.3%aq.	2,000-6,000
pH 3.3%aq.	6.0-8.5
Cloud Point (°C) 3.3% aq.	60.0 ≤
Ignition Residue(%)* ^{1, 2}	≤ 0.2
Heavy metal(ppm)* ²	≤ 20
Arsenic(ppm)* ²	≤ 2

*1 Detection Limit ≤0.1%

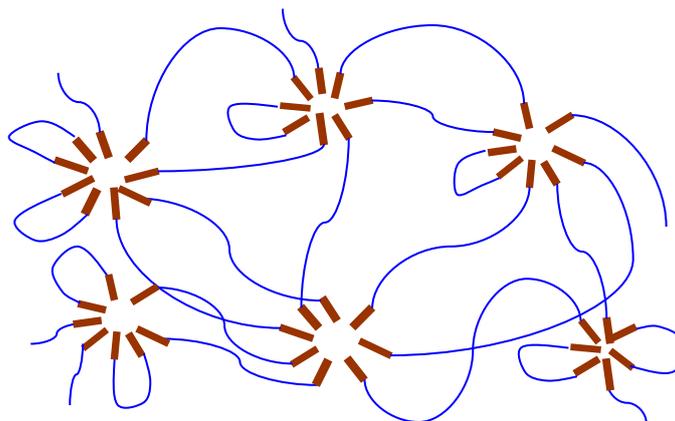
*2 Certified Value (Analyzed two lots a year)

Characteristics

Polymeric framework of GT-730 polymer



Gelation mechanism



GT-730 polymer is composed of hydrophobic segment and hydrophilic segment. It forms micelles like a flower in water.

Association between micelles occurs by adding more than a certain concentration of GT-730 polymer. Then it makes water gel.

Dissolution method

The following conditions are examples to prepare 5%aq of GT-730 in lab-scale.

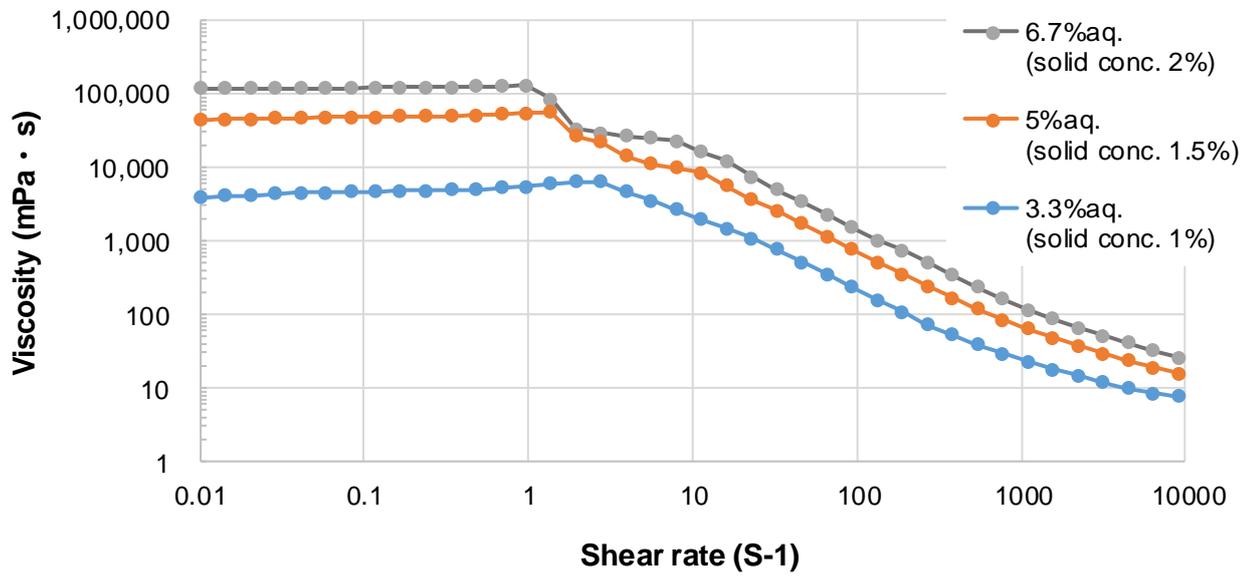
Stirring device	Temp.(°C)	r/min (rpm)	Time
Paddle 	25	250	3 h
	50		1 h
Homo-mixer 	25	4000 - 6000	20 min
	50	2000 - 4000	10 min
Disper 	25	4000 - 6000	20 min
	50	2000 - 4000	10 min

GT-730 can make gel with a paddle mixer, homomixer and disper.

Its gel keeps a viscosity under strong shear. Ex. By a disper for 2 h at 8,000rpm.

Gel properties

(i)Viscosity curve of GT-730 gel

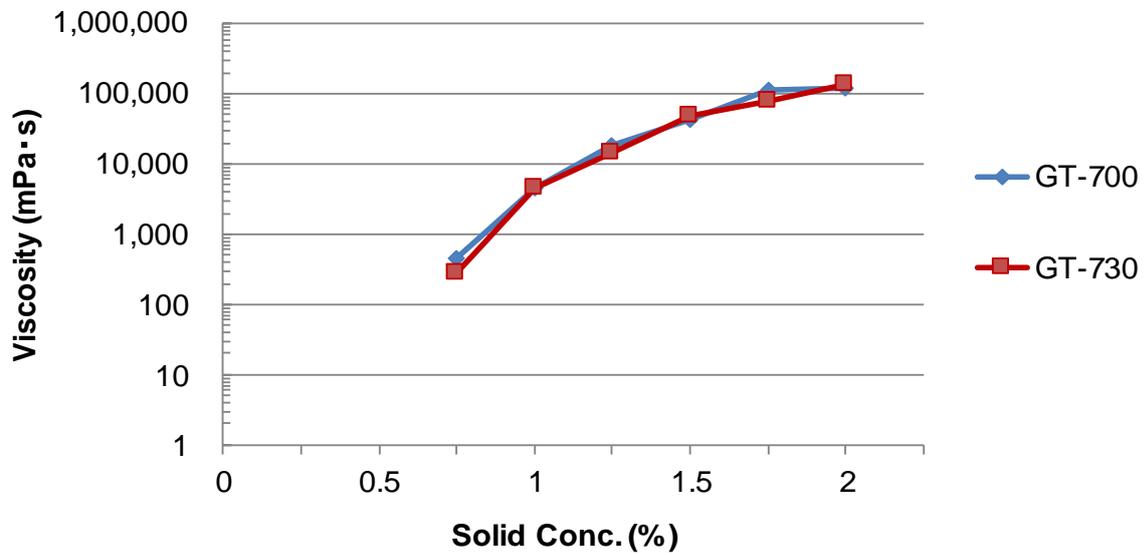


GT-730 gel is thixotropic.

Therefore, the gel can be sprayed.



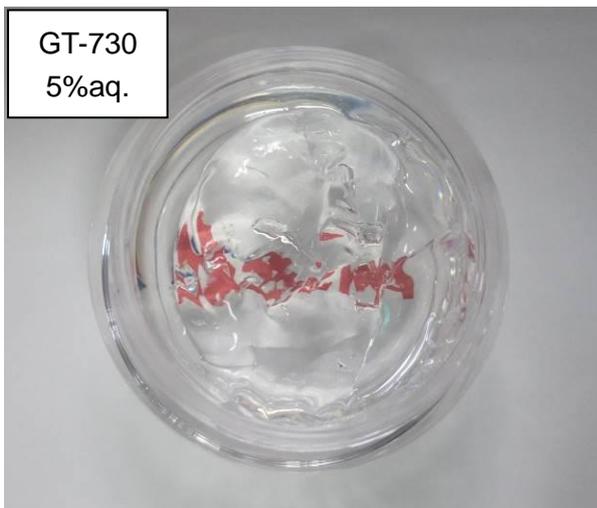
(ii)Viscosity vs. Concentration



Same viscosity is obtained when solid concentration is the same.

(iii)Self smoothing property

Immediately after mixing

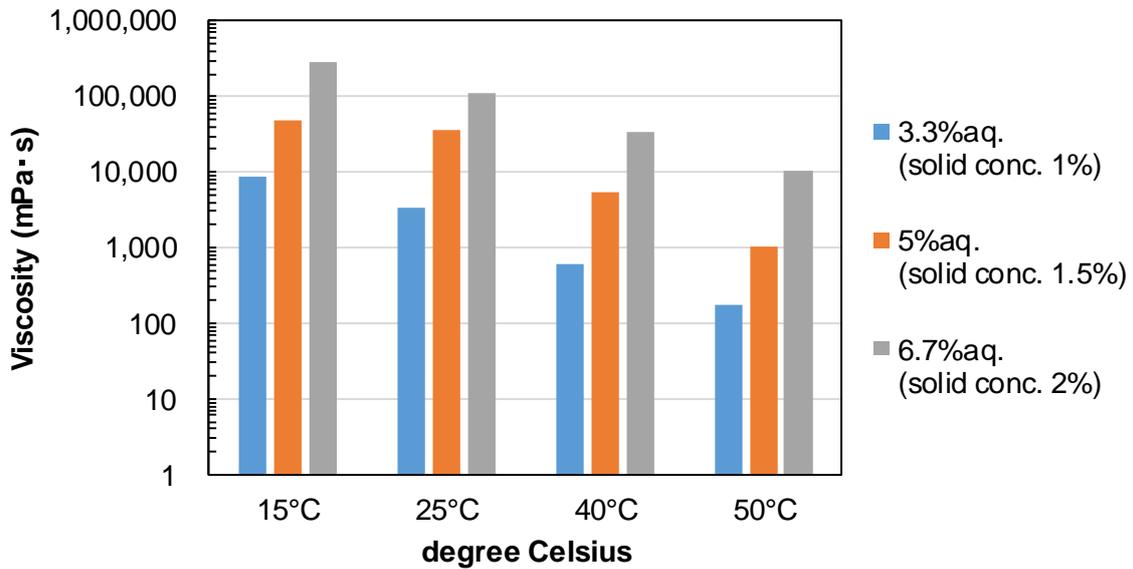


30 seconds after mixing



GT-730 gel has surface smoothness.

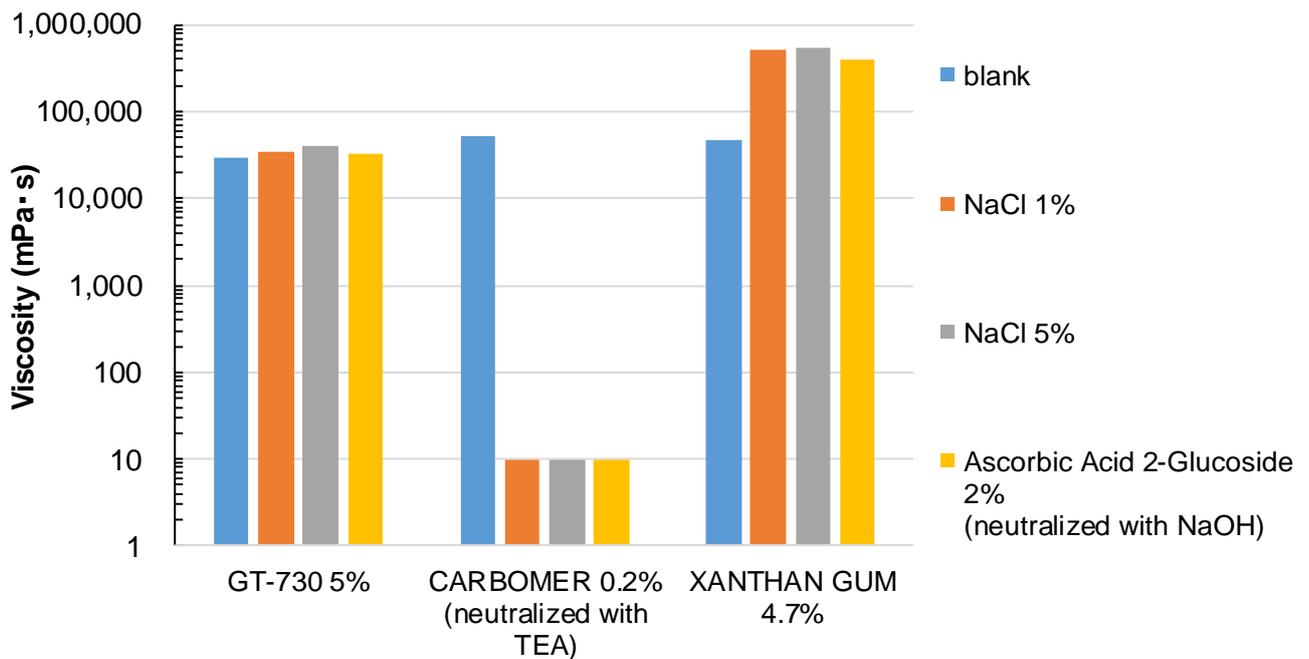
(iv) Influence of temperature



The viscosity changes reversibly by temperature in 15 – 50°C.

The irreversible separation is shown over 60°C due to reach cloud point.

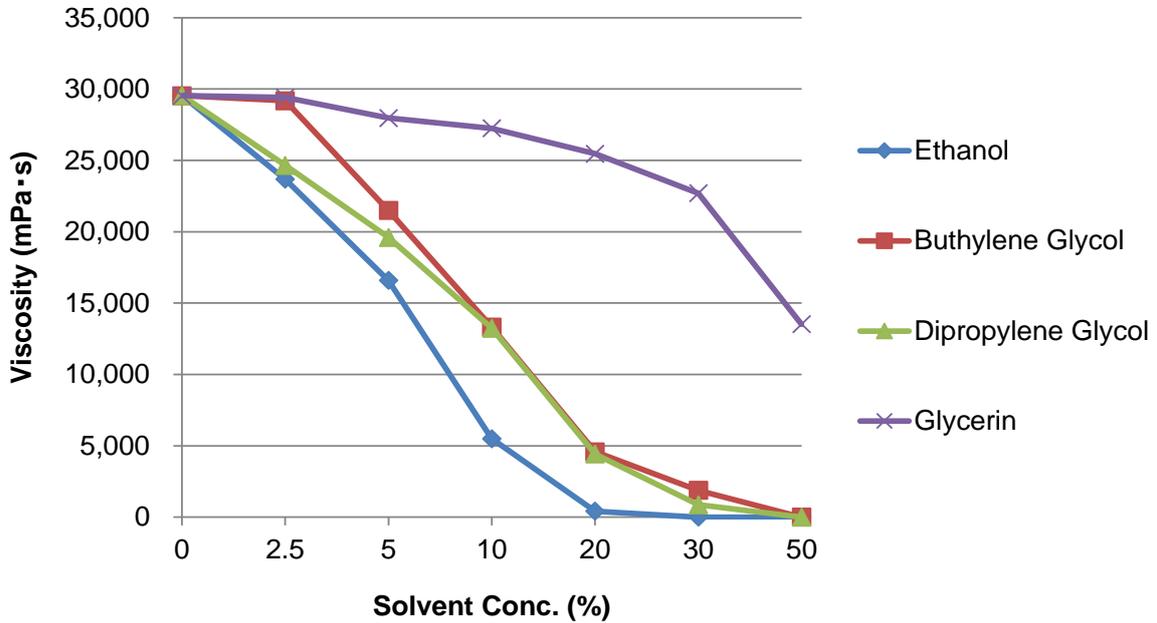
(v) Influence of salts



Both inorganic and organic salt have no influence on the viscosity of GT-730 gel.

(vi) Influence of solvent

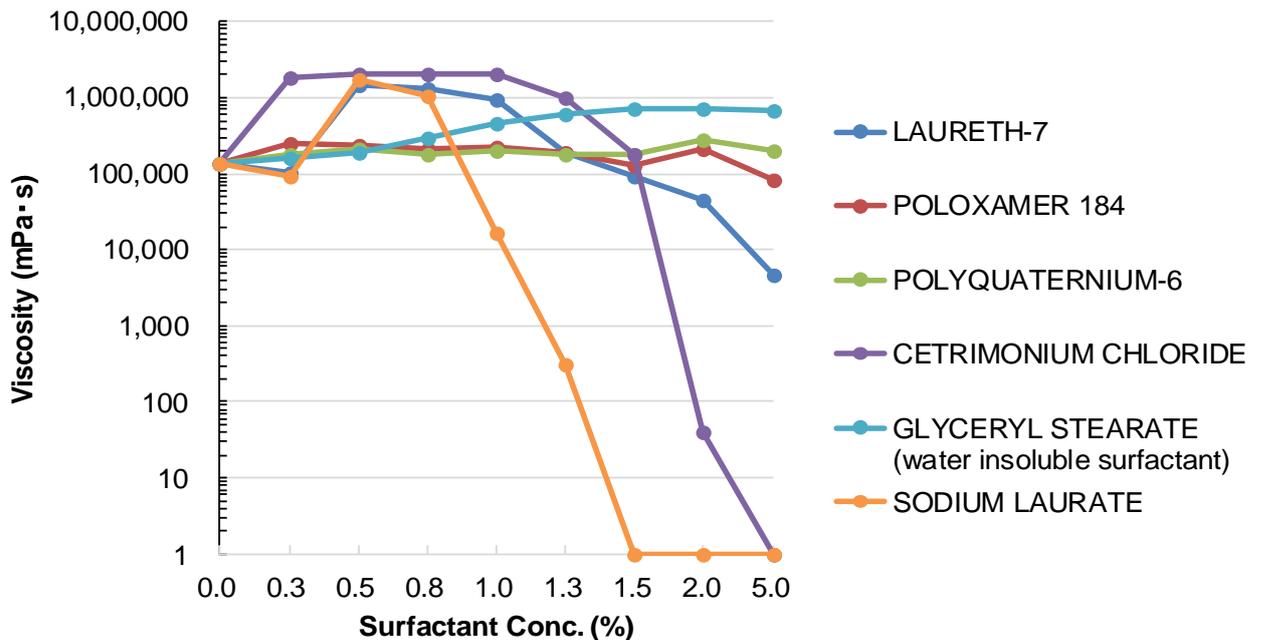
Formulation : GT-730 5% , Solvent X% , Water (95-X)%



The viscosity of the gel decreases gradually by adding the solvents such as glycols.

(vii) Influence of surfactants

Formulation : GT-730 6.7% , Surfactant X% , Water (93.3-X)%



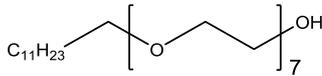
Typical surfactants which have strong surface activity like LAURETH-7, CETRIMONIUM CHLORIDE SODIUM LAURATE increase the viscosity of GT-730 gel until certain concentration. Then they decrease the viscosity.

Water soluble polymer like POLYQUATERNIUM-6 or pluronic type surfactants which have weak surface activity like POLOXAMER 184 have little effect on the viscosity of GT-730 gel.

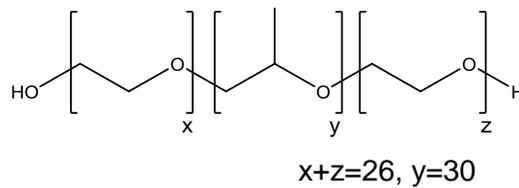
Water insoluble surfactants like GLYCERYL STEARATE make O/W emulsion. And they little effect on the viscosity of GT-730 gel.

- Structure of the surfactants -

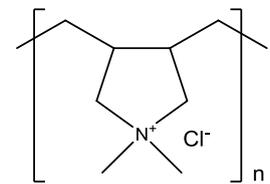
LAURETH-7



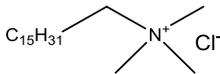
POLOXAMER 184



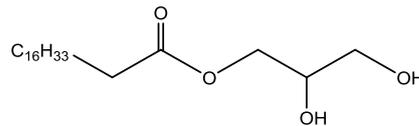
POLYQUATERNIUM-6



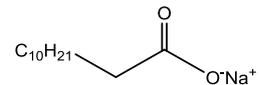
CETRIMONIUM CHLORIDE



GLYCERYL STEARATE



SODIUM LAURATE



Regulatory Information

Area	Inventory	Status
Japan	ENCS	Listed
USA	TSCA	Listed
Canada	DSL	Listed
Australia	AICS	Listed
Korea	KECL	Listed
China	IECSC	Listed
	IECIC	Listed
Taiwan	TCSI	Listed
Philippine	PICCS	Not Listed
EU	REACH	Fully complying with REACH (e.g. Registration)