技　術　資　料

Technical Information

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ORGATIX WATER SOLUBLE LINEUP

Crosslinking agent for polyvinyl alcohol (PVA)

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Orgatix® is the trademark of a Titanium and Zirconium compound which we developed. It is used widely as a crosslinking agent which shows high reactivity for active Hydrogen like Hydroxyl group and Carboxyl group in coatings, printing inks and adhesives industries. Especially its Water Soluble Lineup are attracting attention as a water resistant agent for polyvinyl alcohol (PVA).

1. Characteristics:

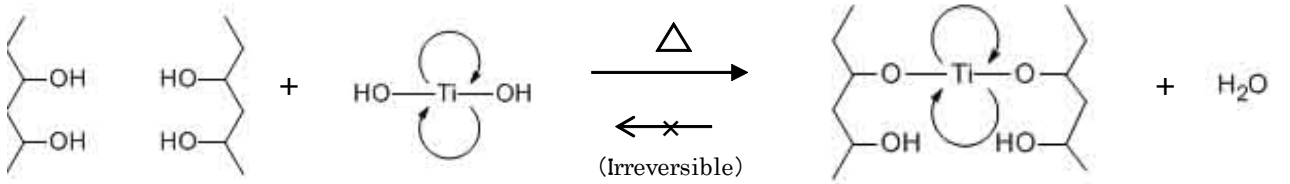
○High reactivity: Irreversible Crosslinking reaction is possible in low temperature (40～120℃) to Hydroxyl group and Carboxyl group.

○High safety: Ames Test Negative (TC-310, ZC-126).

2.Major Industrial Use:

Specialty Paper (Thermal Paper、Inkjet Paper etc)	Adhesive (PVA、Cellulose、Gelatin)	Gelator (PVA gel)

3. Chemical reaction model: (Example: ORGATIX TC-310)



Polyvinyl Alcohol　Titanium compound (ORGATIX TC-310)　Titanium crosslinking PVA　Water

4. Products list and Physical properties table

Trade name		ORGATIX TC-310	ORGATIX TC-300	ORGATIX TC-315	ORGATIX TC-335	ORGATIX TC-400	ORGATIX TC-510	ORGATIX ZC-126
Chemical Name		Titanium lactate	Titanium lactate diammonium salt	Titanium lactate (Nonflammable Type)	Titanium lactate diammonium salt (Nonflammable Type)	Titanium triethanol-aminate	Titanium aminoethyl aminoethanolato	Zirconium compound (Trade secret)
Appearance		pale yellow liquid	pale yellow liquid	pale yellow liquid	pale yellow liquid	pale yellow～yellow liquid	pale yellow～yellow liquid	colorless liquid
Content		44%	42%	44%	35%	80%	70%	30%
Solvent		IPA:40% Water:16%	IPA:38% Water:20%	Water:56%	Water:50% Lactic acid:15%	IPA:20%	IPA:30%	Water:70%
Metal Content		8.2%	6.7%	8.2%	5.6%	8.2%	8.0%	11.1%
pH		1.0	8.2	1	4.4	9.0 (10 fold dilution)	11.0 (10 fold dilution)	3.0
Flash Point		24.5℃	24.5℃	Not applicable	Not applicable	17℃	25.5℃	Not applicable
Crosslinking ability of PVA		Good	Good	Good	Medium	Very good	Good	Medium
stability in PVA		Good	Medium	Good	Good	Bad (Gelling occurs)	Medium	Very good
Inventory	Japan	✓	✓	✓	✓	✓	✓	✓
	USA	N/A	✓	N/A	✓	✓	✓	✓
	Korea	✓	✓	✓	✓	✓	✓	✓
	China	N/A	✓	N/A	✓	✓	✓	N/A
	Taiwan	✓	✓	✓	✓	✓	✓	N/A
Feature		Standard	Neutral pH	Water solvent	Mild acidity	Gelling agent	Basicity	Colorless little Odor

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5-1. Comparison of water resistance of PVA with various kinds of crosslinkers

Crosslinkers	Insolubility ratio(%)
ORGATIX TC-310(315)	64
ORGATIX TC-300	59
ORGATIX TC-335	35
ORGATIX TC-400	76※
ORGATIX TC-510	43
ORGATIX ZC-126	10
40% Glyoxal + 4wt% HCl	0
Borax	0
None	0

※Immediate gelation when added to PVA solution

Additive amount : 17wt% (Crosslinker/5% PVA aqueous solution = 0.85/100 weight ratio)
PVA grade: PVA-117® (Fully Saponifed PVA made by KURARAY CO., LTD. JAPAN, thereafter KURARAY)
Cure condition of PVA : 2 hours×105℃
Water extraction : Immersed in boiling water for 30 minutes, filtered, and dried.
Insolubility ratio(%) : (Weight after boiling) ÷ (Weight before boiling) × 100

5-2. Insolubility ratio vs. Additive amount (Products/PVA) of crosslinkers

＜Cure condition of PVA : 16 hours × 40℃＞

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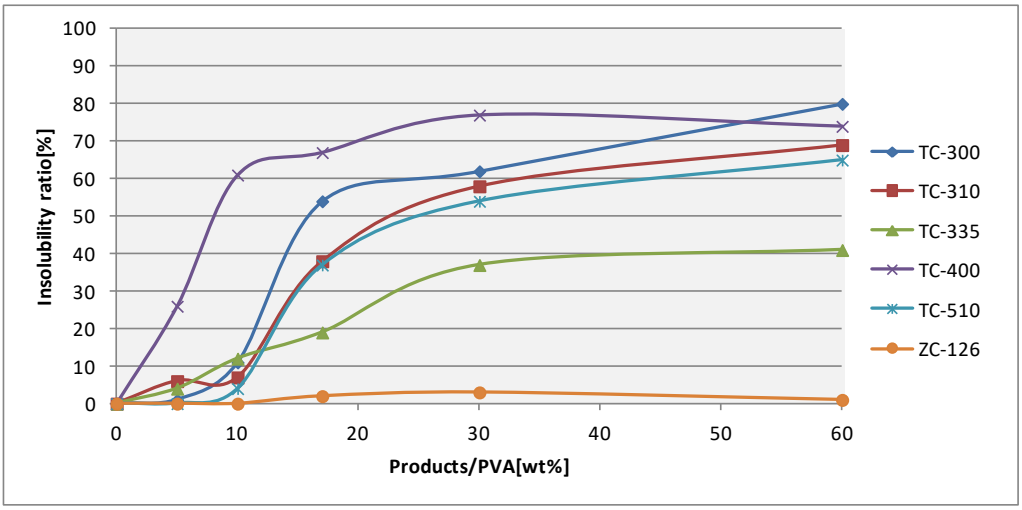

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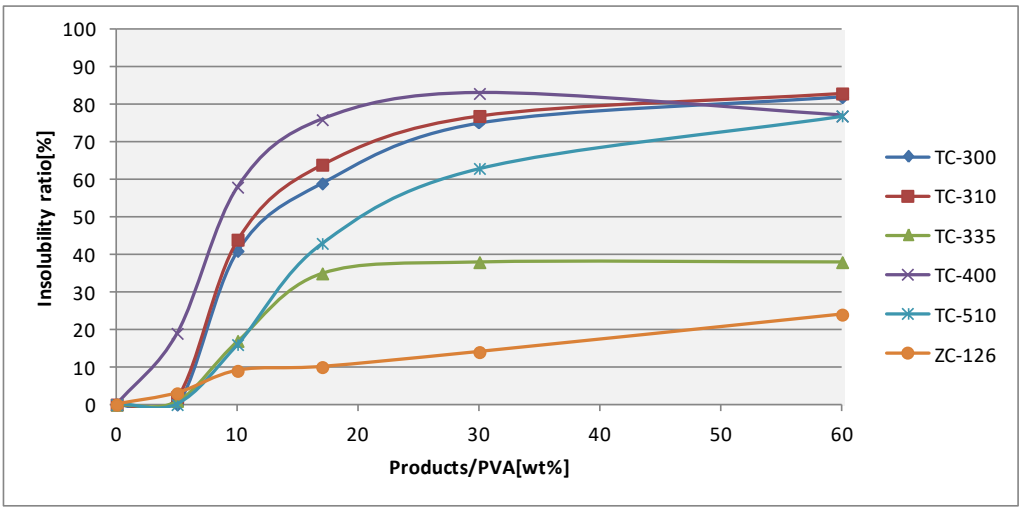

Recommendable Additive amount : You can add "10～30% of ORGATIX ®"

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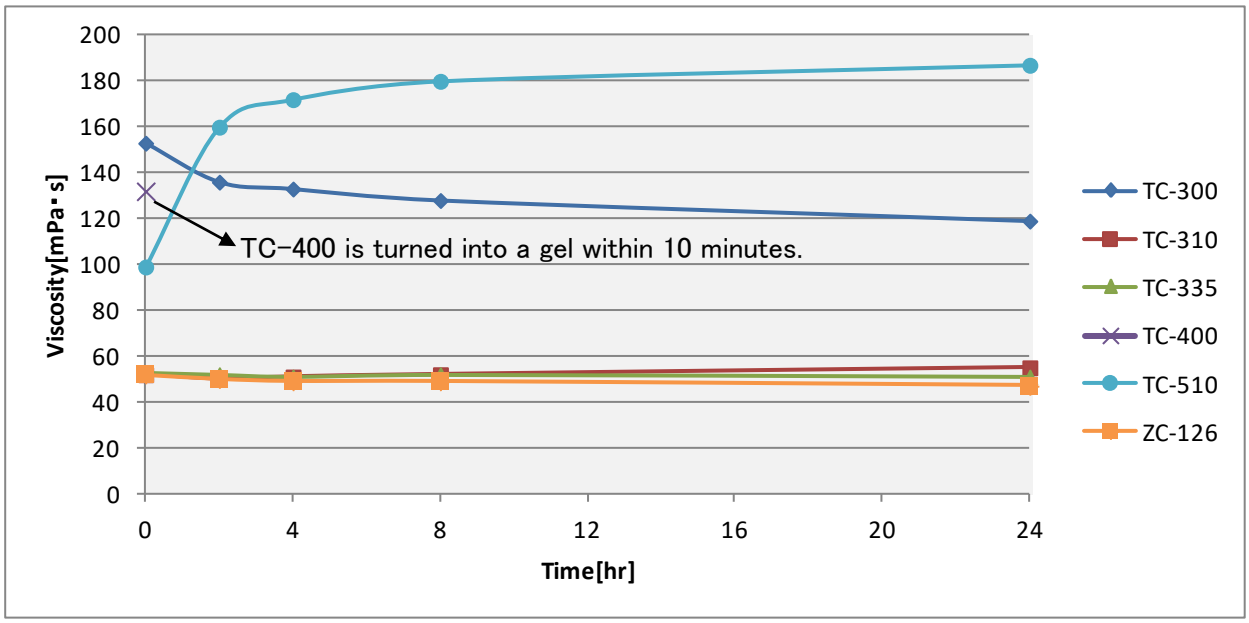
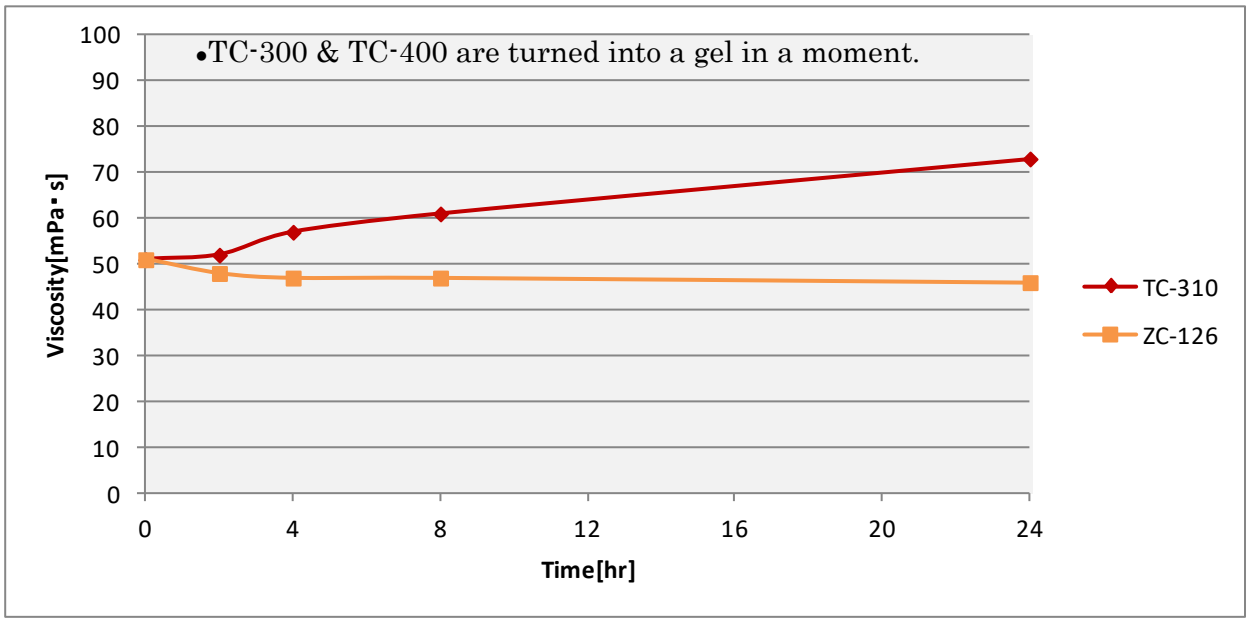
5-3. Viscosity vs. Hour (after Orgatix® added in PVA)

Case①: Products/PVA= 17wt% Room temperature



※ PVA grade = PVA117 (Fully Saponified PVA, made in KURARAY,JAPAN)

Case②: Products/PVA = 50wt% Room temperature



ZC-126 : Viscosity is stable.
TC-310 : Viscosity may increase, depending upon additive amount (wt%).
TC-300 : Even in low wt%, viscosity may be increased.

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6. Caution:

Some products are corrosive and inflammable, so please read our SDS carefully.

The information given in this brochure is based on current our knowledge.
It shows without liability possible uses for our products.

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