技　術　資　料

Technical Information

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ORGATIX TC-100
ORGATIX TC-401

Crosslinking agent

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ORGATIX® is the trademark of our Titanium and Zirconium compounds Among them, ORGATIX TC-100 and TC-401 are widely used as a cross linking agent which shows high reactivitywith active hydroxyl group and carboxyl group in coatings, printing inks and adhesives applications. Especially they are popular in such industries as gravure and flexographic printing inks or coating varnishes with favorable effects.

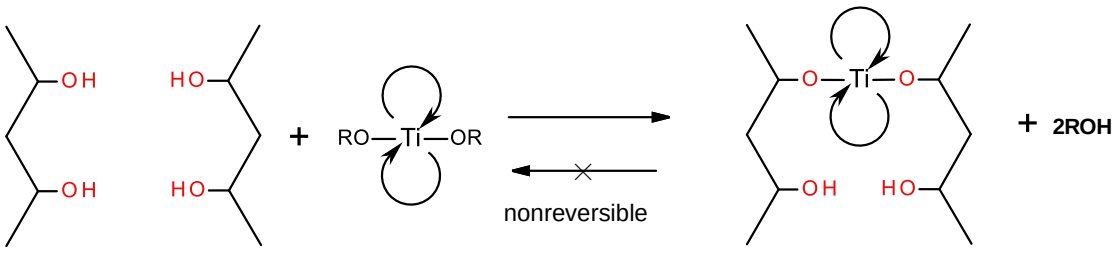
1. Unique Properties:

High crosslinking reaction may possibly occur in low temperature (less than 100℃) without becoming invertible to hydroxyl group and carboxyl group.

2. Main Applications:

Flexographic and Gravure Printing Inks

3. Chemical reaction model:



Hydroxyl group containing resin

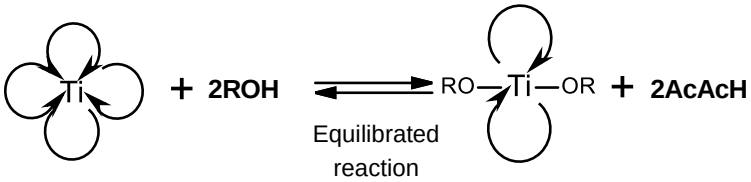
Titanium compound (ORGATIX TC-100)

Titanium crosslinking resin

Alcohol

* : Acetyl acetone(AcAc)

ORGATIX TC-401:



Equilibrated reaction

Titanium compound (ORGATIX TC-401)

Alcohol

4. Chemical Properties and Regulatory Compliance:

Trade name	ORGATIX TC-100	ORGATIX TC-401
Chemical Name	Di isopropoxy titanium bis (acetylacetonate)	Titanium tetarakis(2,4-pentanedionato-O,O')
Chemical Structure	$(C_3H_7O)_2$ $Ti(C_5H_7O)_2$	$Ti(C_5H_7O)_4$
Appearance	Red to blown liquid	Red to blown solid from liquid
Content	75%	65%
Solvent	IPA：25%	IPA：35%
Metal Content	9.8%	7.0%
Flash Point	16.5℃	15.0℃
MITI	2-2161	2-2142
TSCA	17927-72-9	17501-79-0
EINECS	241-866-1	241-511-0
ECL	KE-03394	KE-33882
IECSC	17927-72-9	Non inventory

5. Features and Applicability

ORGATIX TC-100 and TC-401 are crosslinking agents having high crosslinkability and stability. It is advantageously formulated in gravure and flexographic printing inks, or coating varnishes with favorable effects. The agent may provide ink formulations complying with strict requirements in performance of packaging materials for various food products .

5-1. Improvement of Heat Resistance

Packaging films are unavoidably exposed to an elevated temperature, for ensuring increased heat-seals strengths with high speed package bag produciton.

ORGATIX TC-100 and TC-401 may solve a problem of “peeling off” at the heat-sealed part due to the inferior heat resistance of the ink.

5-2. Improvement of Adhesiveness

ORGATIX TC-100 and TC-401 may solve the problem of insufficient adhesiveness of a printing ink on a film such as oriented polypropylene, cellophane, nylon, and aluminum foil etc.

5-3. Improvement of Oil-Resistance

ORGATIX TC-100 and TC-401 may solve oil-resistances of overcoat vanishes.

6. Ink Compositions and Test Results

6-1. Ink for Oriented Polypropylene Film

Composition:

Nitrocellulose: 40 parts by weight
Polyamide resin: 80
Isopropyl alcohol: 170
Toluene: 280
Ethyl acetate: 150
TiO_2: 280
ORGATIX TC-100 or TC-401: 20

Test Result:

Trade name	ORGATIX TC-100	ORGATIX TC-401	not use crosslinker
Heat Resistance	Over 180℃	Over 180℃	Less than 150℃
Adhesiveness	no peeling	no peeling	peeling
Oil Resistance	no peeling	no peeling	peeling

The test is done at our laboratory for reference purpose only. Please note that the results may vary with test conditions.

6-2.Test Methods and Estimation of Results

[Heat Resistance]

Press the inked surface directly with a heat bar under a pressure of l kg/cm^2 for l sec. using a heat-sealing tester: the highest temperature of the heat bar keeping the ink from sticking is considered to be the heat resistant temperature.

[Adhesiveness]

Put a cellophane adhesive tape over the inked surface and tear off the tape hastily: the observation of peeling off of the ink is considered to be "peeling", and little observation to be "no peeling".

[Oil Resistance]

Immerse a printed film in margarine of 25℃ for 1 day. Then take out and rub it with cotton: the removal of the printing ink is considered to be "peeling", and no removal to be "no peeling".

7. Precautions during Use

ORGATIX TC-100 and TC-401 react crosslinkingly with hydroxyl, carboxyl, or ester groups of resins, improving their heat resistance, adhesiveness-and oil-resistances.
For maximum effect, the followings should be noticed.

7.1. For further improvement of heat resistance of ink preparations having predetermined quantities of ORGATIX TC-100 or TC-401, it is necessary to vary the resin's level to be incorporated. For instance, in ink preparations having both nitrocellulose and polyamide resin, it is preferred to increase the level of the former having much hydroxyl and to decrease the latter proportionally.

7.2. When gelation occurs during the addition of ORGATIX TC-100 or TC-401 into ink preparations, the measures should be taken:

a). If the gelation is ascribed to an excessively rapid reaction of ORGATIX TC-100 with hydroxyl or carboxyl groups of resins.

i) Add ORGATIX TC-100 or TC-401 diluted with isopropyl alcohol to the ink preparations little by little,

ii) Partially replace the solvent in the ink preparation with ethyl cellosolve, butyl cellosolve or ethyl lactate to prevent the gelation, or

iii) Keep the temperature of the prepared ink below 30℃ during the addition of ORGATIX TC-100 or TC-401.

b). If the gelation is ascribed to the reaction of ORGATIX TC-100 or TC-401 with water in the prepared ink (water content should be kept less than 5%), carefully select ingredients (resin, solvent, pigment, etc.) containing less water.

c). If the gelation is ascribed to the reaction of ORGATIX TC-100 or TC-401 with pigments in the ink preparation, previously test on the pigment mixed with ORGATIX TC-100 or TC-401 in the rate as in the preparation for the observation of any reactions .

7.3. Yellowing of Ink Preparations

ORGATIX TC-100 may result in yellowing especially in white ink preparations at addition levels over 4%. In such cases, lowering of the level or the replacement with ORGATIX ZC-l50*) is recommended.

*) Zirconium Acetylacetonate

7.4. Thickening of Ink during Printing Operation

When printing operations are continued, the moisture in the air causes thickening of ink preparations containing ORGATIX TC-100. In such a case, the coating bath should be protected against water from the air, or replace ORGATIX TC-100 with our ORGATIX TC-401, grades more stable against water.

7.5. Clogging

When printing operations are over, the rolls should be cleansed well with isopropyl alcohol or ethyl acetate, prior drying, since compositions containing ORGATIX TC-100 or TC-401 become insoluble in solvents after dried.

8. Caution

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

The information given in this brochure is based on the present state of our knowledge.

It shows without liability possible uses for our products.

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Revised date : Jan 7th 2013