

Textile auxiliaries

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The new sequestering agent

OPTAVON NW



ZSCHIMMER & SCHWARZ

...THE SOLUTIONS PROVIDER



OPTAVON NW = *the product four in one*, chemical and physical properties:

SEQUESTRATION (= CHELATION, = COMPLEXATION)

- complexing behaviour: formation of mainly water-soluble chelat-type complexes with alkaline-earth ions (Mg^{2+} ; Ca^{2+} ; Ba^{2+}) and heavy metal ions (Fe^{2+} , Fe^{3+} e.g.)
- retarding the precipitation of various sparingly soluble alkaline earth salts

SCALING INHIBITION (= THRESHOLD EFFECT, = HARDNESS STABILISATION)

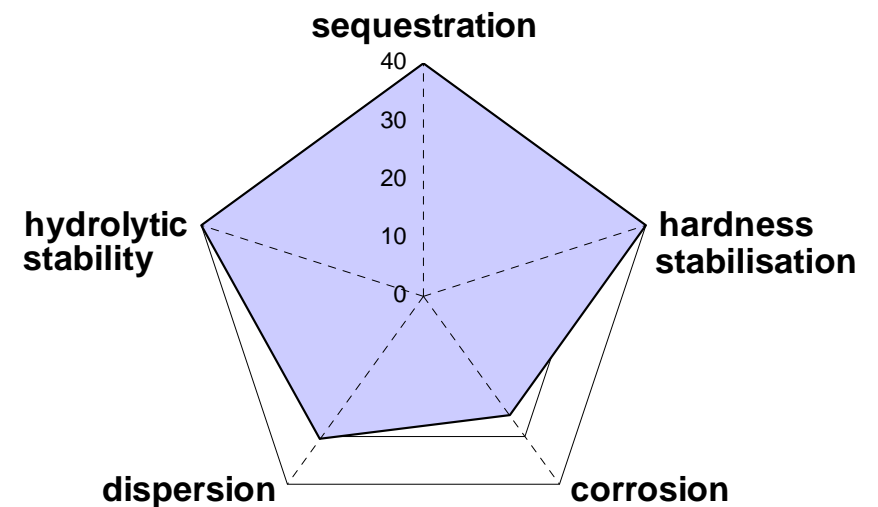
- effect at only sub-stoichiometric concentrations
- stabilisation of supersaturated solutions
- prevention of uncontrolled precipitation

DISPERSION (= DEFLOCCULATION)

- dispersion of solid materials
- synergistic effects / better detergency power
- increase of degree of whiteness, high fastness level

CORROSION INHIBITION

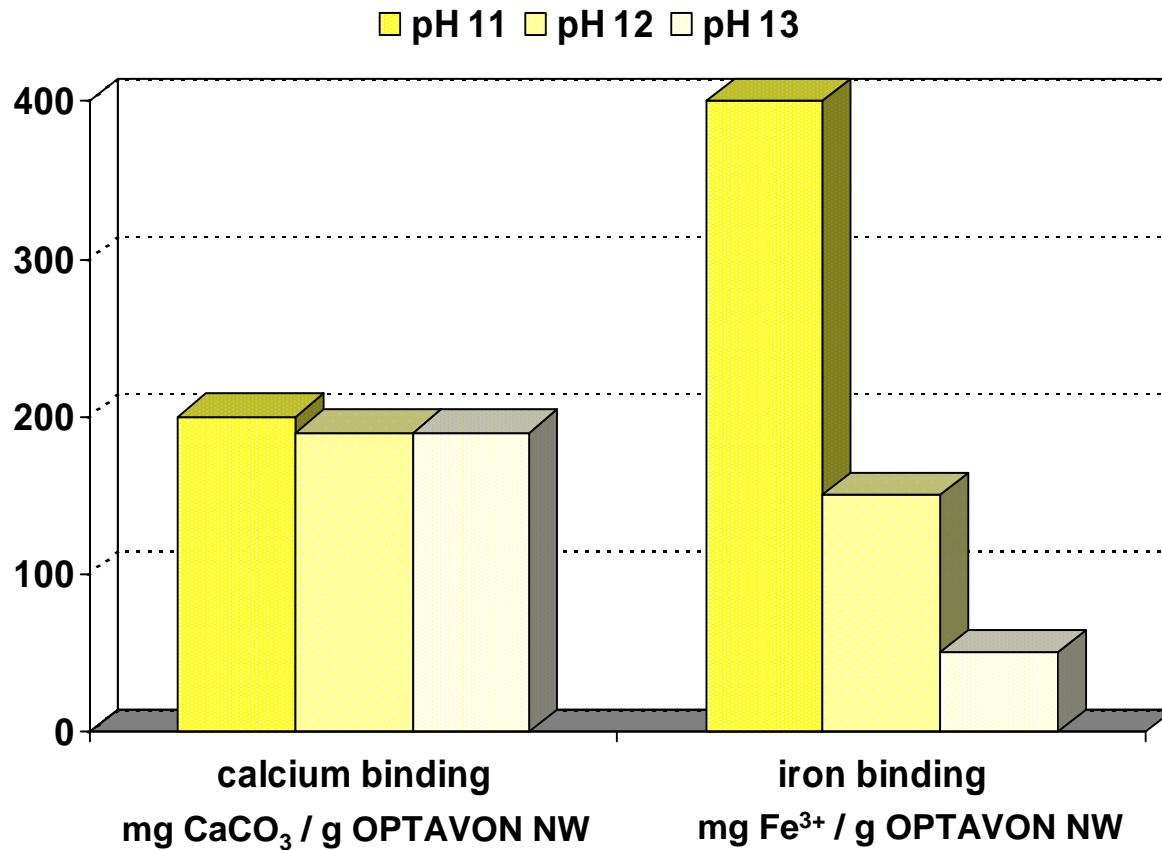
- formation of protective layers on metal surfaces



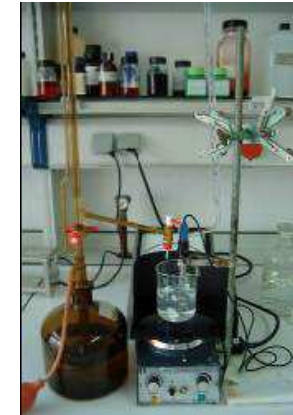
1. Sequestration: Calcium and iron ion binding capacity

Standard test methods:

Ca-binding: ZSM-method 3001
 Fe-binding: : ZSM-method 3002



OPTAVON NW shows a high calcium binding behaviour at all three pH-ranges. **OPTAVON NW** has an excellent iron binding behaviour at pH 11 and moderate binding capacities at strong alkaline conditions.



ZSM-method 3001
acc. to Hampshire-Test



ZSM-method 3002, boiling by reflux

Rapid test methods

a) Hardness ($\text{Ca}(\text{OH})_2$):

[The usage of hardness test strips is not recommended, since this method is based on the acid binding of carbonates and its resulting pH-value and following colour reaction. Sequestering agents that consist phosphonic- or polyacrylic acid plus their salt have an influence to the acid binding, consequently they do sophisticate the final result.]

liquor: 100° German Hardness (= 1800 ppm CaCO_3)
+ 2 ml/l NaOH (50%) to adjust pH 12
+ x g/l OPTAVON NW

- add sequestering agent slowly until liquor is clear while stirring well, stirring time around 10 min
- liquor should be clear for more than 5 min, if not, more sequestering agent is needed



without sequestrant

milky calcium precipitation under alkaline conditions ($\text{Ca}(\text{OH})_2$).



8 g/l

9 g/l

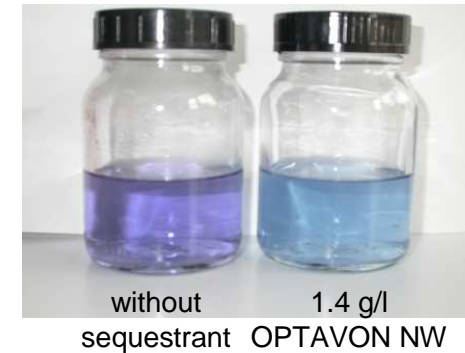
10 g/l

The beaker with the maximum concentration (10 g/l OPTAVON NW) is demonstrating an outstanding bath stability (Scaling inhibition, Threshold effect). Treatment baths including OPTAVON NW remain clear for several days. This way, undesired precipitation on machinery and textile substrates caused by earth alkaline ions are prevented safely.

The needed amount of OPTAVON NW to complex all calcium ions completely corresponds exactly with the results from the Hampshire test method.

b) Hardness (Eriochrom Black):

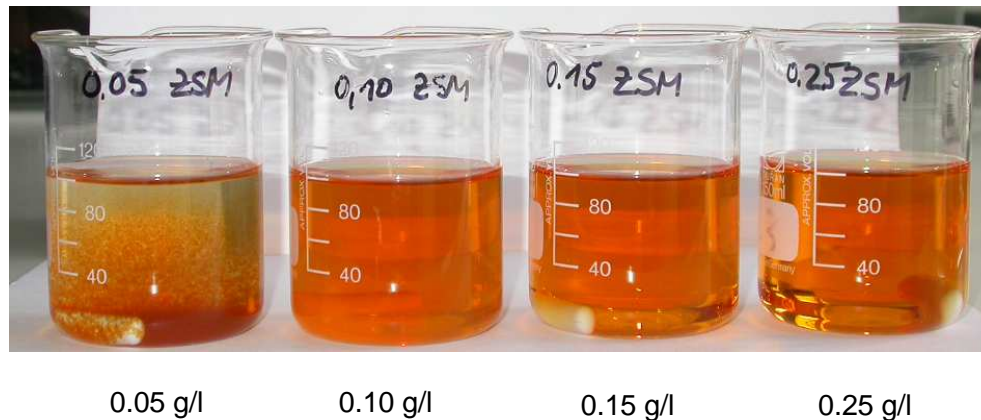
- use standard solution with 100 ppm hardness (100 ppm CaO)
- take 100 ml, adjust with puffer to pH 11-12 (ammoniumhydroxide)
- add indicator Eriochrom Black T -> violet colour
- titration with sequestering agent (1% solution) to a final bluish-green colour



c) Catalyts (Fe(OH)₃):

liquor: 480 mg/l FeCl₃ x 6 H₂O (= 100 ppm Fe³⁺)
+ x g/l OPTAVON NW
+ 0.5 - 1 ml/l NaOH (50%) to adjust pH 11

- add sequestering agent firstly, stir well, add caustic, stir well, evaluation takes place after 5 min when liquor remains clear



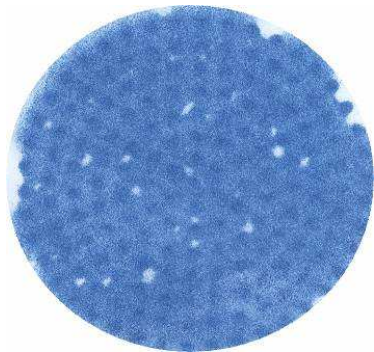
OPTAVON NW has an outstanding iron binding behaviour at pH 1.

Only 0.10 g/l usage amount is required to mask all iron ions in order to prevent iron precipitation safely.

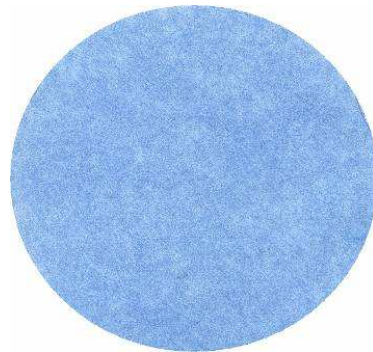
2. Dispersing power of OPTAVON NW:

Execution vat dye: water (20° German Hardness),
9.4 ml/l NaOH (45%), 2.5 ml/l dye solution (1% Indanthrene Blue BC), 5.0 g/l sodium dithionite, 1.0 g/l sequestrant - 30 min 60°C

a) Vat dyes:



without sequestrant



OPTAVON NW

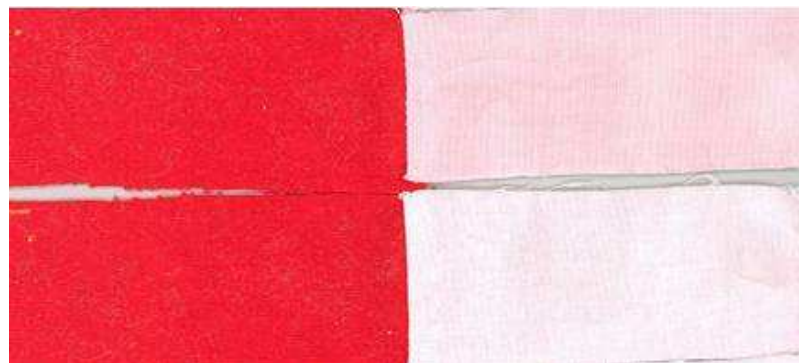
less agglomerates by using
OPTAVON NW

b) Reactive dyes:

Standard soaping process for reactive dyes:

Fastness to washing 60°C ISO 105-C03

100% CO, dyed with 6% Levafix Scarlet E-2GA, water 15° German hardness



without sequestrant
mark 1 - 2

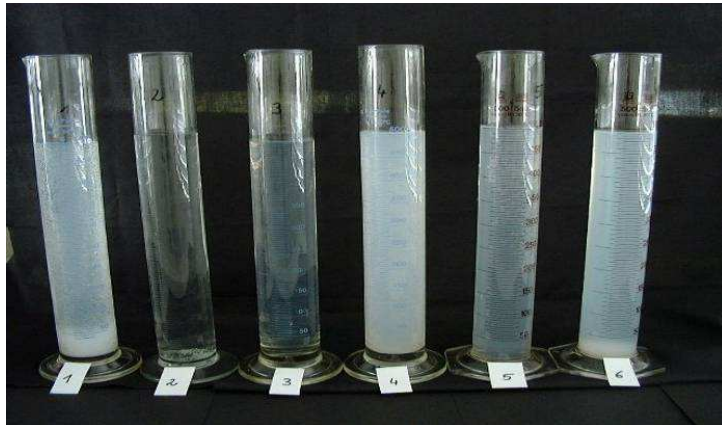
OPTAVON NW
mark 3 - 4

In dyeings and subsequent washing operations, OPTAVON NW prevents the formation of dyestuff agglomerates and supports the cleaning effect. OPTAVON NW has no negative influence on the light fastness of a dyeing.

c) Silicate:



immediately



after 1 hour

execution:
water (20° German Hardness)
1.0 g/l auxiliary
10 ml/l water glass (38°Bé)
50 ml/l H₂O₂ (35%)
20 ml/l NaOH (50%)

inspection:
immediately
at room temperature,
after 1 hour,
after 24 hours


1-without auxiliary, **2-OPTAVON NW**, 3-OPTAVON MEX,
4 / 5 / 6 - rival product references



after 24 hours

OPTAVON NW prevents precipitations of calcium and magnesium salts in alkaline scouring and bleaching processes, in particular when silicate is used.

Purpose of use of OPTAVON NW in textile pretreatment:

 = main application field where the product shows its best performance	washing	desizing	demineral.	alkaline scouring	bleaching	neutralizing	dyeing processes
OPTAVON NW							

Washing processes: 0.5 – 1.5 g/l OPTAVON NW	<ul style="list-style-type: none"> ◆ Dispersing of impurities, increasing the detergency power of surfactants ◆ Preventing of precipitations caused by hardness elements
Desizing: 2.0 – 4.0 g/l OPTAVON NW	<ul style="list-style-type: none"> ◆ Removal of alkaline earth and heavy metal ions ◆ Dispersing of residual sizes / contaminations ◆ Increasing the degree of whiteness during subsequent peroxide bleaching
Alkaline scouring: 0.5 – 3.0 g/l OPTAVON NW	<ul style="list-style-type: none"> ◆ Decomposition of insoluble calcium pectinates ◆ Removal of heavy metal ions
Peroxide bleaching: 0.5 – 3.0 g/l OPTAVON NW	<ul style="list-style-type: none"> ◆ Protection from precipitations caused by hard water ◆ Sequestering of iron and heavy metals
Dyeing process / Aftersoaping: 0.5 – 3.0 g/l OPTAVON NW	<ul style="list-style-type: none"> ◆ Preventing of precipitations caused by hardness elements ◆ No demetallising effect on dyestuffs, no negative influence on the light fastness of a dyeing ◆ Prevents the formation of dyestuff agglomerates and supports the cleaning effect

OPTAVON NW

the all-rounder for pretreatment and dyeing

- ✓ **with a very good calcium binding power and effective protection for hard water**
- ✓ **excellent iron binding behaviour, high performance at pH 11**
- ✓ **outstanding dispersing power for all kind of impurities and dyestuffs**
- ✓ **increasing of whiteness and absorbency during bleaching**
- ✓ **low price level and competitive**



This information and our advice are given in good faith but without warranty. Our advise does not release you from the obligation to check its validity and to test our products as to their suitability for the intended process and uses.