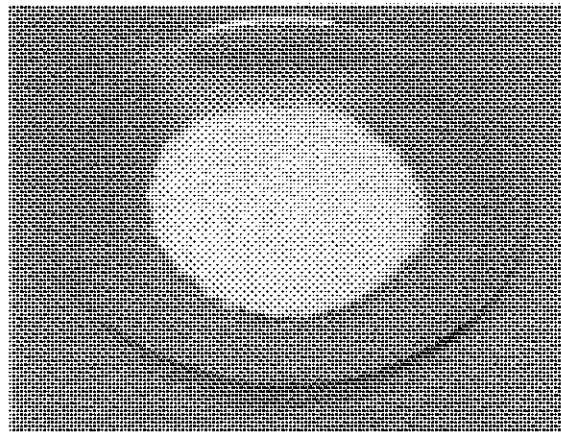


Carboxymethylcellulose

CMC

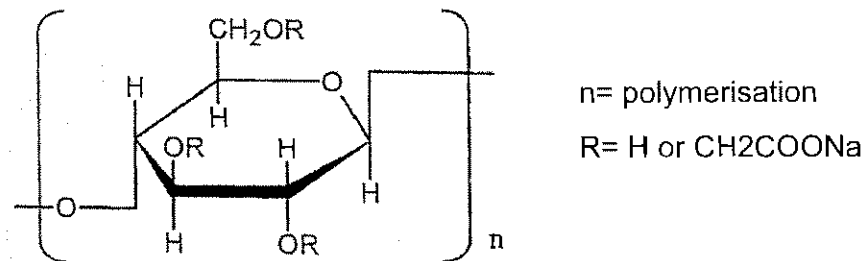
an alternative to crystal stabilisation



Dipl.-Ing. Robert Könitz

What is carboxymethylcellulose ?

- synonyms: CMC, cellulose gum, gomme de cellulose
- known as thickening agent (E 466)
- use in food industry (yoghurt, soups, sauces)
- polymers consisting of anhydroglucose units



- viscosity: 2 % solution 20 - 40 mPa/s
- solubility:

in water:	moderate under formation of a viscous colloidal solution
in wine:	poorly soluble
in ethanol:	insoluble

Legal basic conditions

- first trials in Germany in the mid 1980s
- in the last few years again trials in the Champagne area with white and sparkling wine
- since March 2006 international studies at the OIV with approval of Resolution 2/2008 and purity specification in 2009
- since August 2009, EU approval VO 606/2009
- CMC is allowed without restriction for wine and for all categories of sparkling wine and semi-sparkling wine
- maximum dosage: 10 g/100 L

CMC for crystal stabilisation

- trials at Erbslöh since the mid 1980s
- protective colloid against crystal growth
- no inactivation through temperature fluctuation
- lasting prevention of crystal precipitations
- reduced effect against Ca-deposits
- addition at least 3-4 days prior to membrane filtration
- full-bodied wines, potassium and tartaric acid are preserved
- less costly, reduced working expenses through easier product treatment

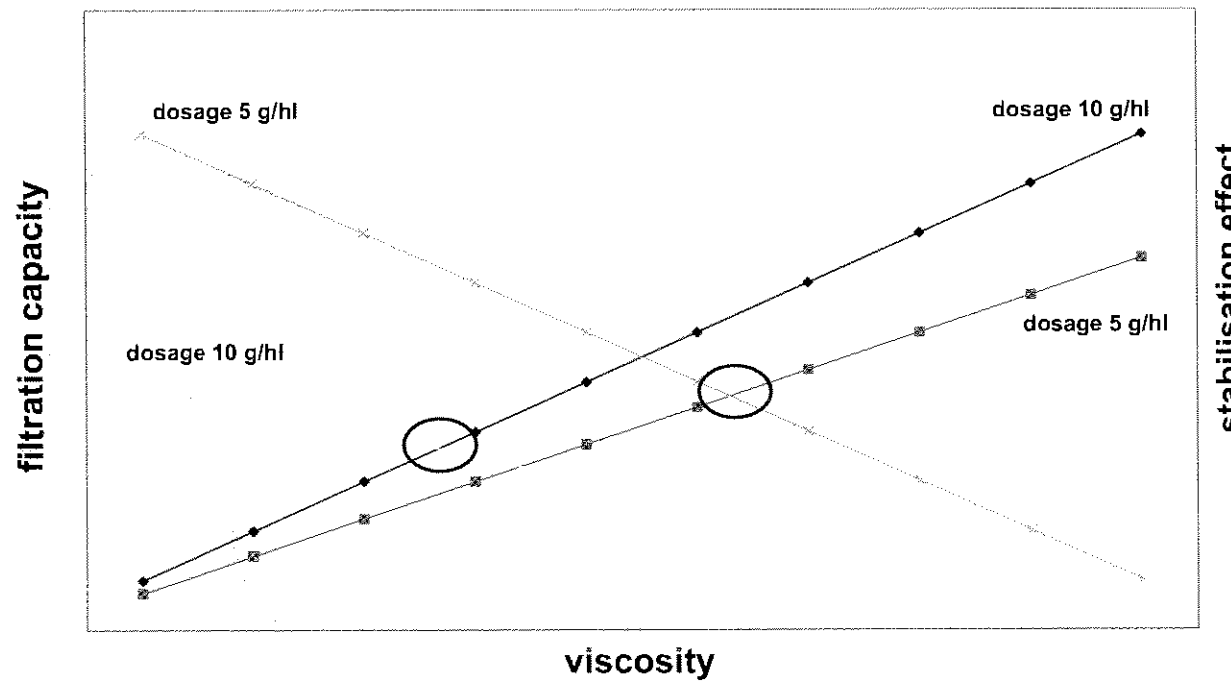
Comparison of crystal stabilisation methods

crystal stabilisation method	reduced process costs	reduced staff expenses	environmentally friendly	easy application	effect against Ca-crystals	longterm effect	impact on filtration	foreign matter with wine	preservation of natural acid
contact process	-	-	-	-	+/-	+	-	-	-
metatartaric acid	+	+	+	+	-	-	+/-	-	+
CMC	+	+	+	+	-	+	+	+	+
mannoproteins	-	-	+	-	?	?	+	-	+

- every method has advantages and disadvantages
- carboxymethylcellulose is no cure-all
- choice dependent on customer requirements

optimal combination of stabilisation and filtration capacity

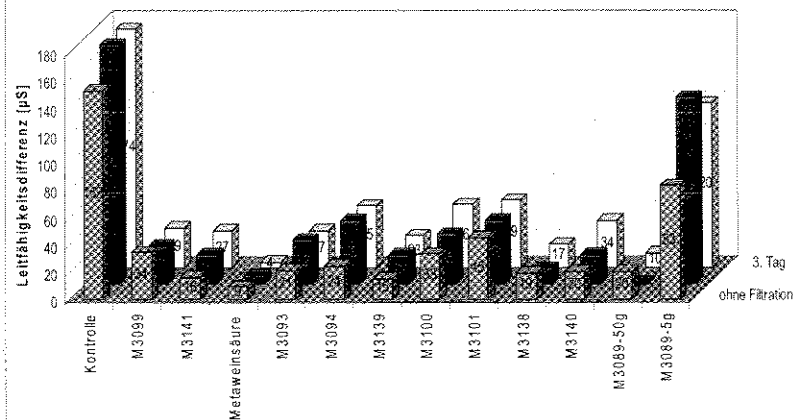
Erbslöh-project "CMC"



Product development of VinoStab®

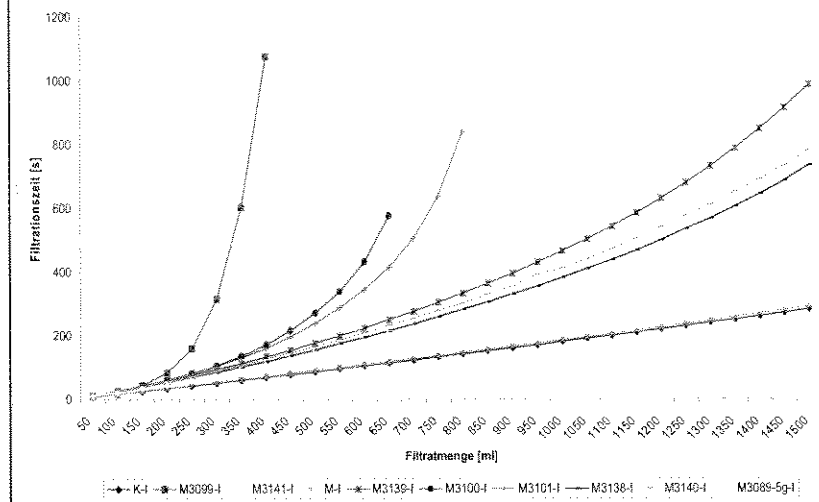
ERBSLÖH
Geisenheim

Minikontaktverfahren: Leitfähigkeitsdifferenzen



crystal stability

Filtrationsleistung [ml/s] nach direkter Filtration



filtration capacity

screening of 12 different raw materials!

Product characteristics of VinoStab®

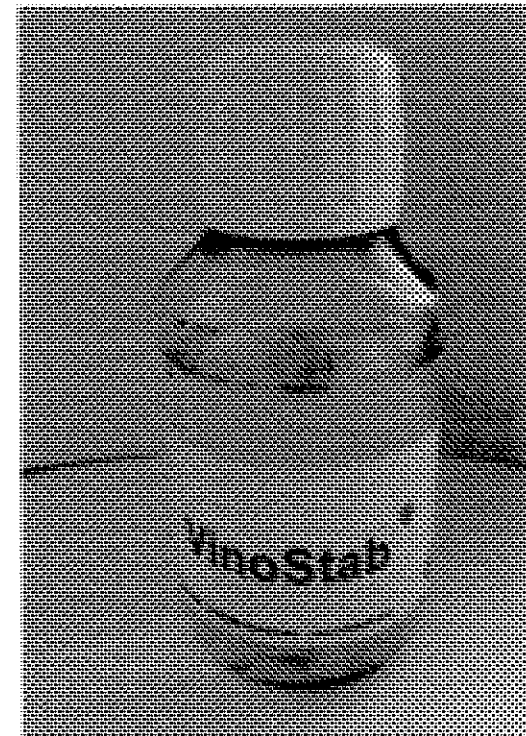


- aqueous carboxymethylcellulose solution (E 466) for a lasting prevention of crystal precipitations in wine
- special selection of optimal carboxymethylcellulose
- appearance: clear, slightly opalescent viscous liquid
- solid matter: > 7.5 %
- pH-value: 4.5 ± 0.5
- dosage: 75 -130 mL/100 L (legal maximum 130 mL/100 L)
- complies with the specifications of the International Oenological Codex (OIV Resolution 2/2008)
- non-GMO – non-allergenic
- neutral in taste and smell

Advantages of the liquid product VinoStab®

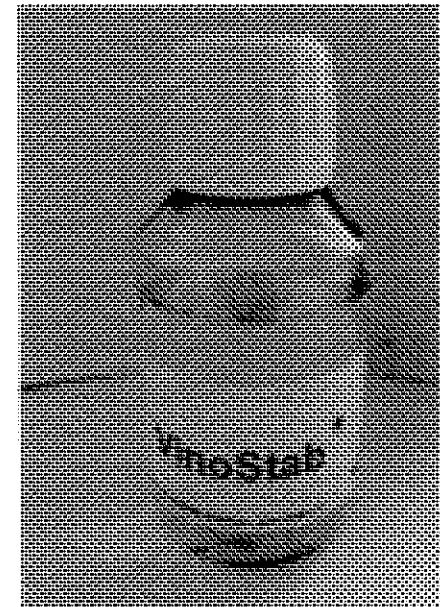


- application as powder product is very difficult, strong lump formation
- less soluble in wine than in water
- liquid product is easier to apply
- homogeneous distribution in wine
- direct addition possible
- higher CMC concentration in the product is realised by industrial production



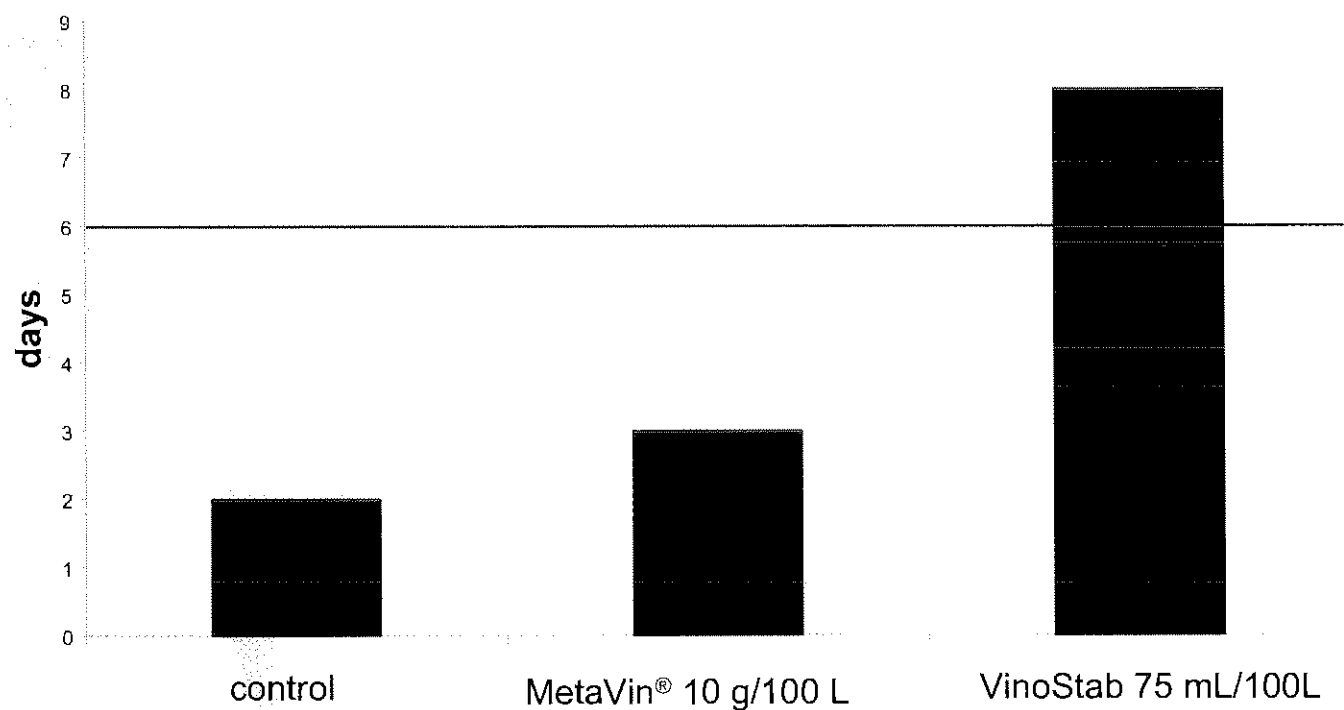
Advantages of the liquid product VinoStab®

- low costs for personnel since work-intensive cleaning of mixing tanks is not necessary
- hygiene – remains of product are hardly removable and tend to microbial spoilage
- no risk of slipping caused by product dust
- application in 25 L canisters is most effective for large-scale wineries
- with a dosage of 75 mL/100 L, water input amounts to maximally 0.75 mL/L



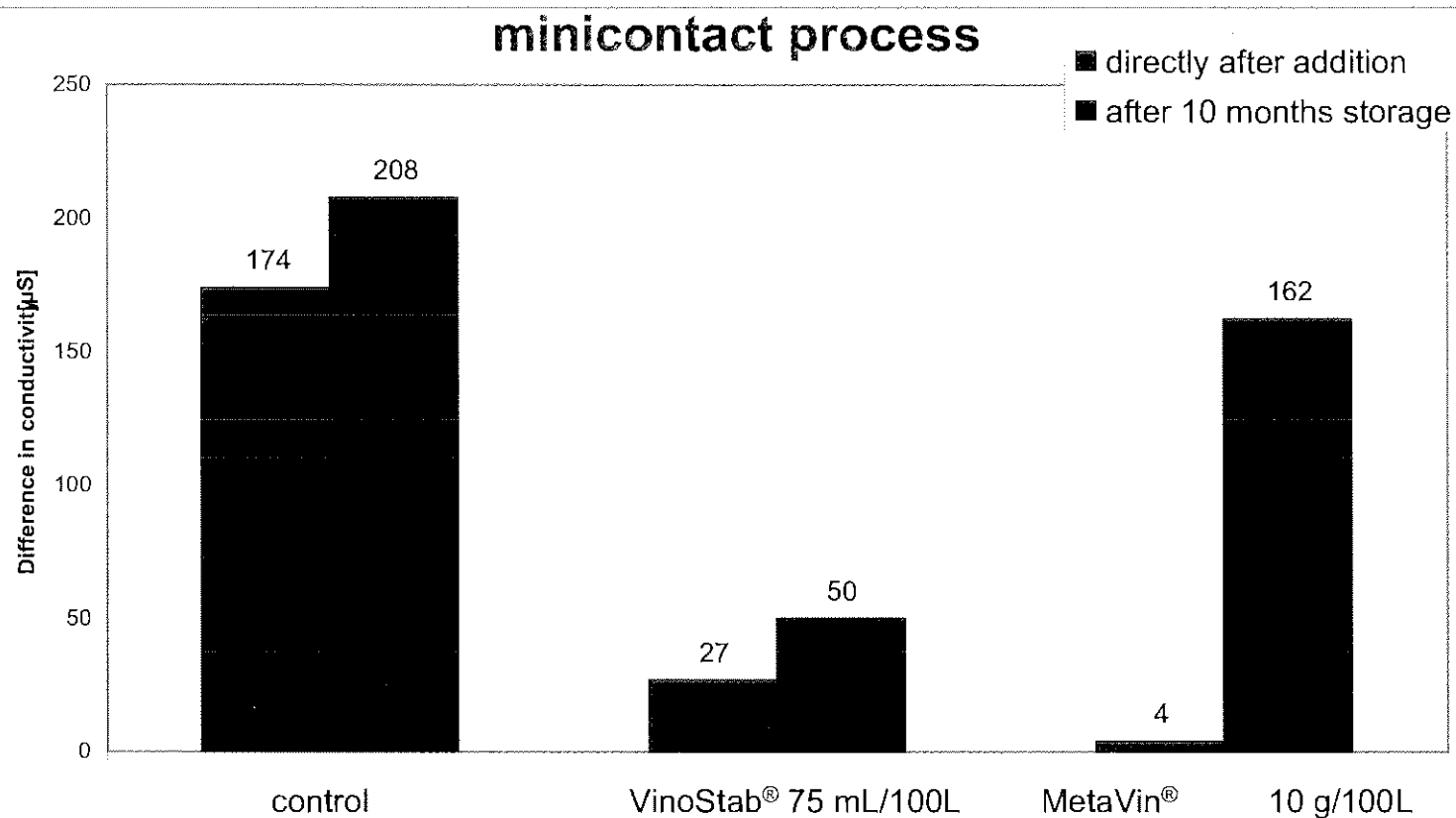
Stabilising effect of VinoStab®

stability test (-4°C)



test wine with potassium hydrogen tartrate saturation temperature of 18 °C

Stabilising effect of VinoStab®

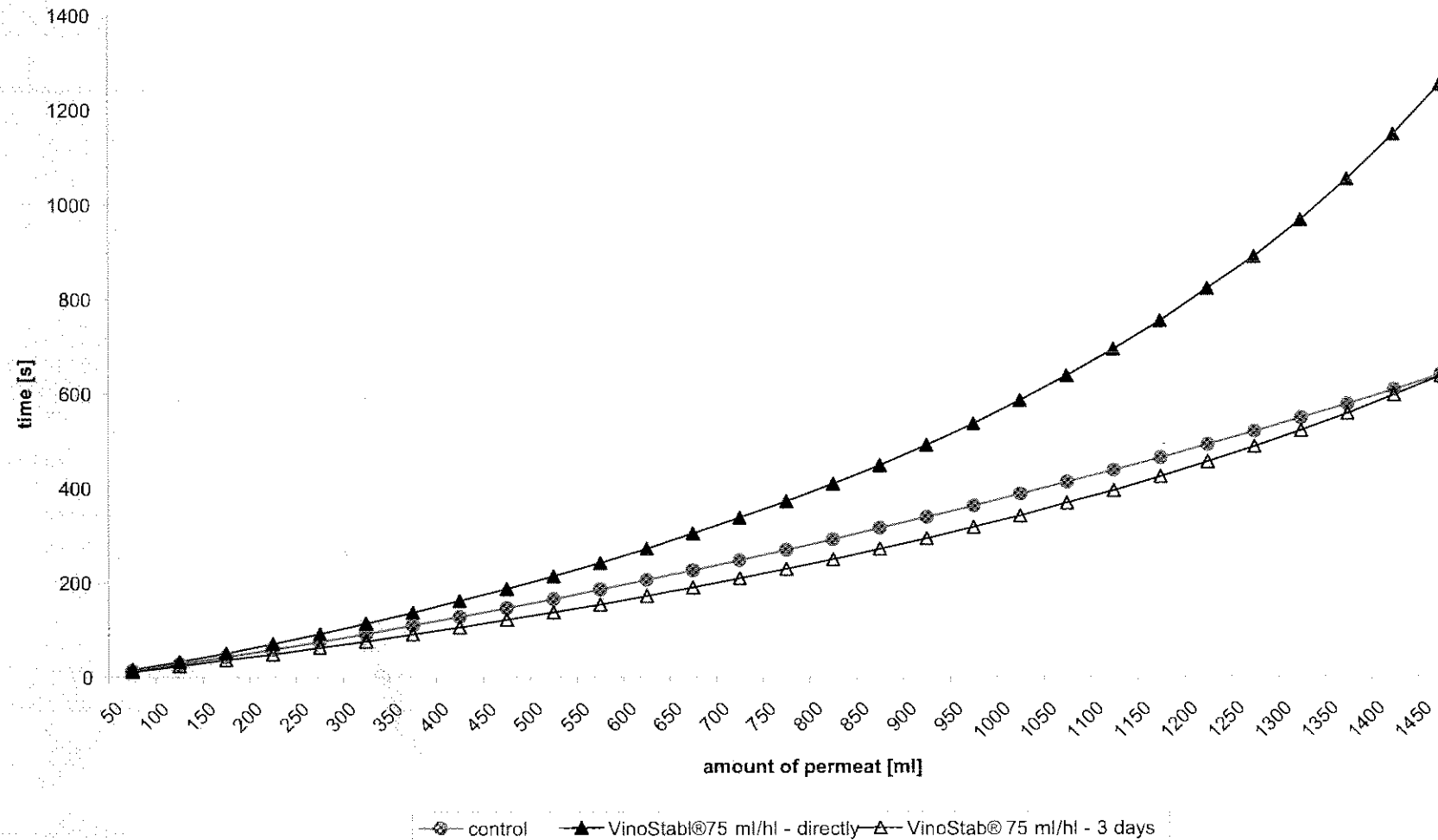


test wine with potassium hydrogen tartrate saturation temperature of 20 °C

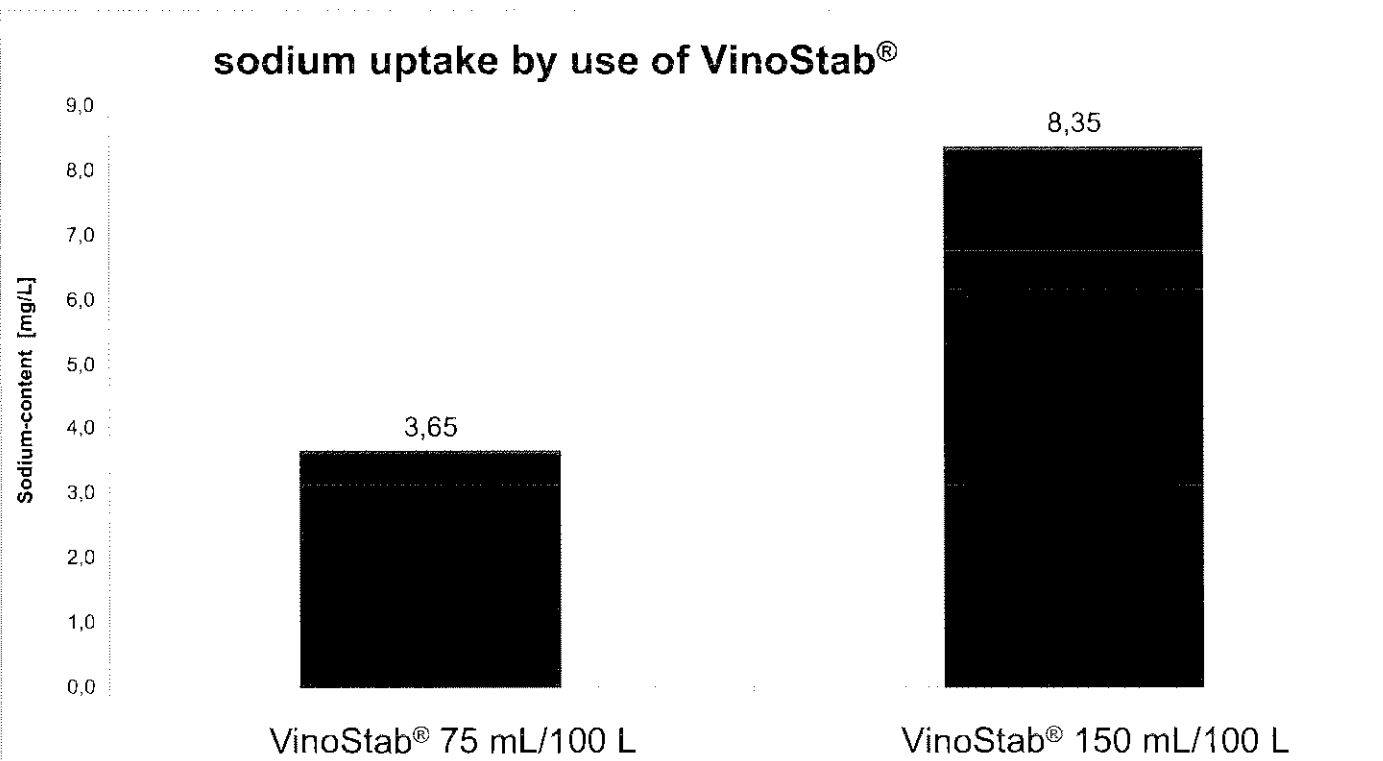
Filtration capacity of VinoStab®



effect of VinoStab® on filtration in dependence on time



sodium content of VinoStab®
related to dry matter < 10 %



Why should you be interested in VinoStab® ?

Why should you be interested in VinoStab®?



- With VinoStab® you have a liquid special product available which is not directly comparable yet has a lot of additional benefits.
 - No microbiological risks
 - Less cleaning
 - Safe application
 - Cost-effective etc.
- With VinoStab® you are in a position to offer your customers an even safer young wine stabilisation. Crystal stabilisation is again timely and you have the lead.
- With pretests (filtration index, EasyKrista Test) and samples you will obtain a still better relationship with customers.

We will gladly assist you – please call us!!!

Summary

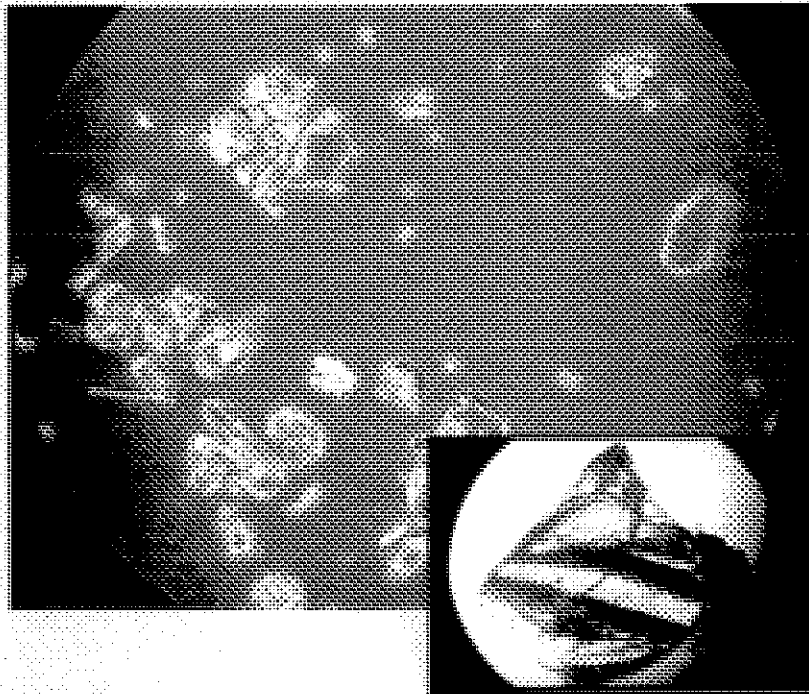


- with the approval of carboxymethylcellulose a further possibility for crystal stabilisation is available
- the main advantage is its long-term effect for permanent stabilisation
- stabilising effect also at saturation temperatures up to 18°C
- limited effect against Ca-deposits
- VinoStab® as liquid product is easy to handle, safe and cost-effective

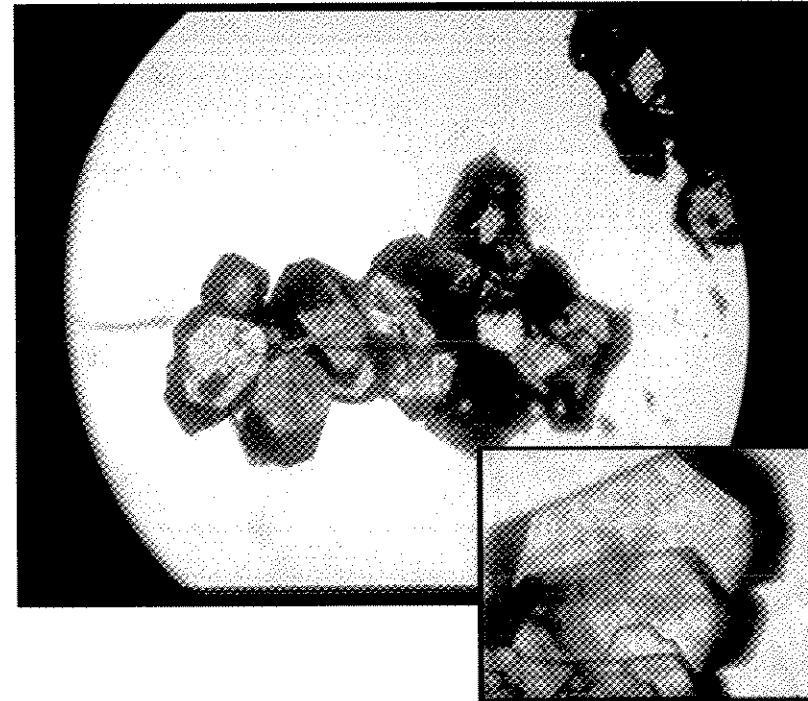
Erbslöh Geisenheim AG



Thank you for your attention



K-tartrate



Ca-tartrate

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