EFFECT OF TEMPERING ON THE STABILITY OF CHOCOLATE GANACHE

Foods

INTRODUCTION

The tempering is an essential step in the chocolate fabrication process, since it confers to chocolate a glossy and attractive aspect. Tempering also allows the chocolate to set quickly, to be easily removed from molds and prevents from bloom formation.

Chocolate contains cocoa butter fat, which can be composed of six different crystal forms. The tempering of chocolate consists in cooling the chocolate paste while mixing under precise conditions, in order to obtain only one form of crystal. As a result, it is important in chocolate industry to perform a correct tempering.

Chocolate ganache is an emulsion composed of chocolate and cream, which can be found in many pastries. Ganaches are generally prepared by pouring warm cream over chocolate; this operation melts almost all the crystallized cocoa fat in the chocolate. It is important to keep or reform the beta crystal form of chocolate, which will enhance the stability of the emulsion. In this note, we propose a method to assess the stability differences between tempered and non-tempered ganaches.

METHOD

Two samples of chocolate ganaches were analysed using the Turbiscan LAB at 30°C during 7 hours. One ganache was prepared with tempered chocolate while the other was not.

RESULTS

Identification of destabilization phenomena

The following graphs display the delta-backscattering signal for the non-tempered sample.

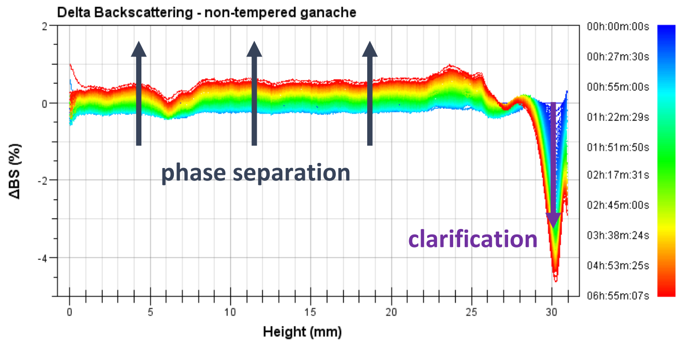


Figure 1: Delta-backscattering signal for non-tempered ganache at 30°C.

The Turbiscan profile display a decrease in the top of the sample (right part of the graph) and an increase in the middle and bottom of the sample (left part of the graph). It means that the concentration of scatterers is decreasing at the top and increasing at the bottom of the sample. In other words, phase separation is occurring in the sample, with a clarification at the top. Figure 2 shows that a slight clarification is occurring at the top of the tempered sample.

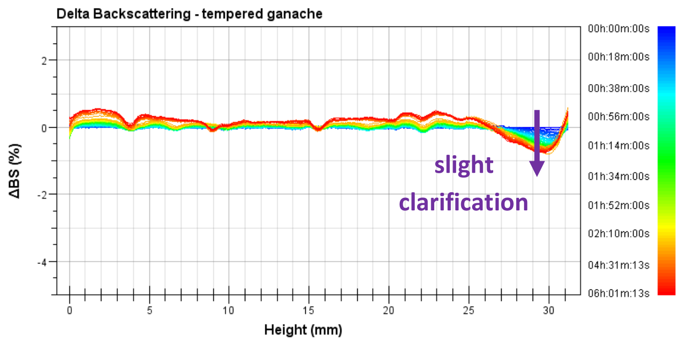


Figure 2: Delta-backscattering signal for tempered ganache at 30°C.

Global stability

In order to assess global stability, all the destabilisations occurring in the sample have to be taken into account. The Turbiscan Stability Index was created in this purpose. This one-click tool sums all the variations over the whole height of the sample. As a result, if the signal varies a lot, the TSI will be high; therefore, the higher the TSI, the lower the stability.

Figure 3 displays the evolution of TSI as a function of time for both tempered and non-tempered samples.

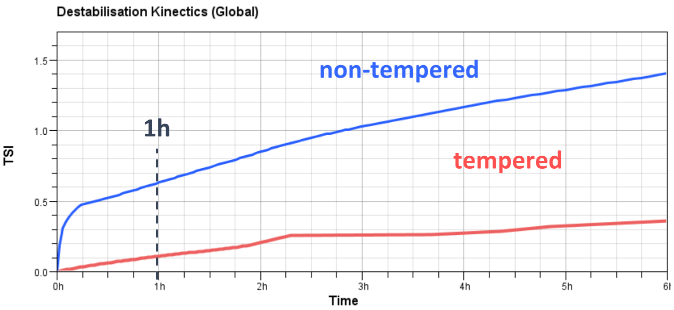


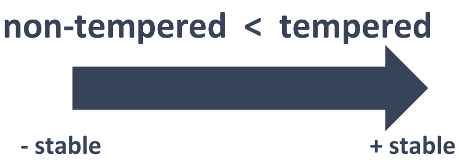
Figure 3: TSI values as a function of time for tempered and non-tempered ganaches at 30°C.

This graph shows that TSI values are higher for the non-tempered sample than for tempered one. This means that at 30°C, the tempered ganache is more stable than the non-tempered ganache.

The following table summarizes the TSI values after 1 and 6 hours of measurement.

Sample	TSI @ 1 h	TSI @ 6 h
tempered	0.1	0.4
non-tempered	0.6	1.4

This table shows that samples can be differentiated after **only 1 hours** of measurement.



SUMMARY

The Turbiscan LAB enables to identify and quantify destabilization phenomena. Differences between tempered and non-tempered chocolate ganaches were identified in terms of stability. Chocolate ganache sample which has been previously tempered is more stable than non-tempered one.