

EXAMEN : BACCALAURÉAT GÉNÉRAL	SESSION 2011
ÉPREUVE : Évaluation spécifique de langue en section européenne	
PHYSIQUE-CHIMIE en langue ANGLAISE	SUJET N°3

Natural aging of wine

Wine is one of the few consumable goods that can improve with time, given, of course, the right set of circumstances. What is it about the chemistry of wine that improves with age?

Wine is a complex combination of many chemical compounds, which change as they interact with each other and their environment. Intricate reactions between the acids, sugars, alcohols, esters and phenolic compounds in wine are what modify the aromas in the bottle. When we age wine, we hope for changes that cause the wine to mature well by gaining a complex mix of complimentary flavors. As the chemical reactions that take place during aging vary between grape varieties, regions, and even crops from year to year, they are not easily quantifiable.

Esters are a type of compound that contributes to the wine's aroma. Esters are created when the alcohol in the wine reacts with the acids. The type of yeast used during fermentation plays a major role in determining what kind of esters are produced during the process of esterification. Hydrogen ion, which is more abundant in wines with greater acidity, encourages this reaction to take place. Paradoxically, the presence of the hydrogen ion can also cause the reaction to reverse, turning esters into alcohol and acid. This complex reaction is one of the ways in which wine could be called a « living, breathing organism »: the give-and-take between esters and their primary compounds means that the flavors in wine are constantly changing. The esters in a Chardonnay opened after 2 years might taste of pears. After 5 years, they might have developed into a distinct buttery flavor. But the esters are not the only chemicals that influence the aroma...

Adapted from <http://www.vintagecellars.com>

Questions :

1. Present and comment this document.
2. Do not forget to focus on at least one physics and/or chemistry topic as for example the esterification reaction and its main properties.
3. What do you know about or artificial aging of wine ?