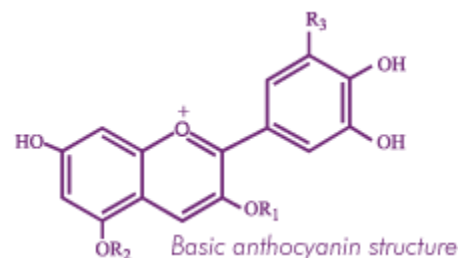


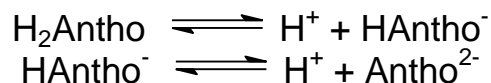
EXAMEN : baccalauréat Général – Série S –SVT ou S-SI	SESSION 2014
EPREUVE : Evaluation spécifique de Langue en section européenne	
PHYSIQUE – CHIMIE en langue ANGLAISE	
THEME : REACTIONS CHIMIQUES	Sujet n°03

Colours of Red Cabbage* ...

Organic compounds tend to be colored when they contain an extensive conjugating system. This moves the absorption band of the molecule from the UV to the visible region giving it color. The molecule in red cabbage responsible for its color is an *anthocyanin*. Anthocyanins are a large group of plant pigments that occur in all higher plants including flowers and fruits.



Anthocyanins are weak acids. When weak acids have different colors depending upon the number of protons that remain with the molecule, we call them acid-base indicators. If we were to represent an anthocyanin molecule and two removable protons as H_2Antho , the equilibria showing the loss of its protons would be:



The colors that would be seen would be as described in the table beside.

[H ⁺]	color
very high	red
high	mixture of red and blue
moderate	blue
low	mixture of blue and yellow
very low	yellow

Therefore, it is possible to determine the pH of a solution based on the color it turns the anthocyanin pigments in red cabbage juice.

<http://chemistry.about.com/od/acidsbase1/a/red-cabbage-ph-indicator.htm>

http://resources.educ.queensu.ca/science/main/concept/gen/q09/l.%20Jansons/natural_ph_indicators.htm

http://firstyear.chem.usyd.edu.au/demonstrations/worksheets/5.8_answers.pdf

http://www.chem.umn.edu/services/lecturedemo/info/Cabbage_Indicator.html

* Red cabbage : Choux Rouge

Questions :

1. Present and comment on this document.
2. Do not forget to focus both on acid-base transformations and on pH.
3. Red cabbage is used in titration as a color dye indicator. Do you know any other ways to measure the amount of substance in chemistry ?